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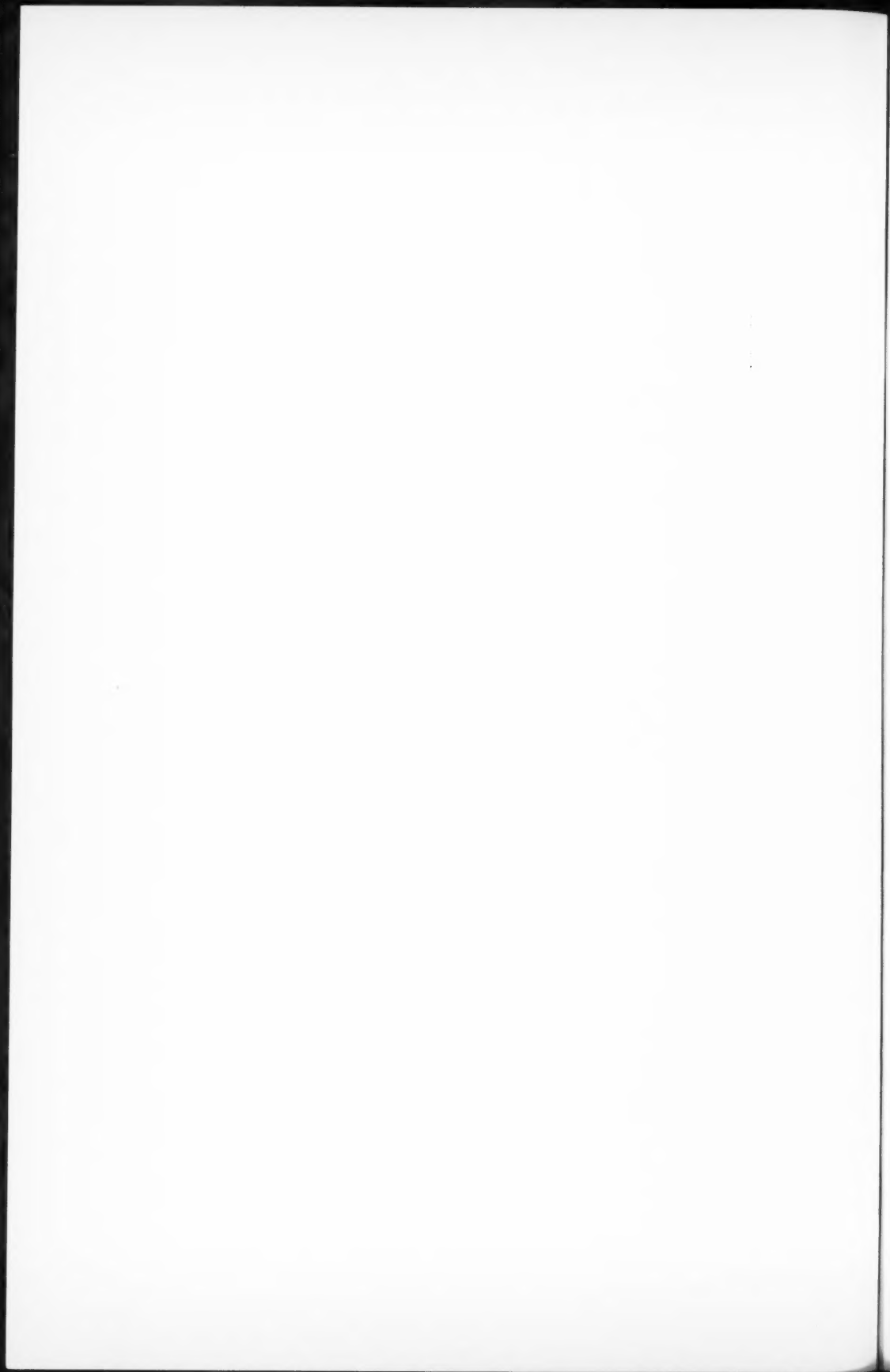
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KATSUO TAKEDA: GEOGRAPHICAL PATHOLOGY OF
CANCER IN JAPAN (REPORT BASED ON
AUTOPSY AND BIOPSY CASES)

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GEOGRAPHICAL PATHOLOGY OF CANCER IN JAPAN **(Report based on Autopsy and Biopsy Cases)**

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International Society of Geographical Pathology)

I. INTRODUCTION

Since, within recent years, the annual mortality from cancer has tended to increase in Japan, attempts have been made, from the pathological and clinical standpoints and from the statistics of mortality, to clarify the geographical features of the disease. Among others, the late Professor M. Nagayo was the first to try to assess the real incidence of cancer in Japan, having recourse to the statistics of causes of death, as reported by hospitals and as derived from autopsy cases. However, the real incidence of the disease is quite difficult to assess, since those statistics are liable to be affected by various social and medical factors. For this purpose, it is indispensable to accumulate from many sources as great a body of data as possible exactly diagnosed or precisely examined. The statistics of mortality, those from hospitals and those from autopsy cases, which all serve as materials in a study of this kind have respectively their own advantages and disadvantages.

1. Statistics of mortality. It is true that the statistics of mortality annually published by the Ministry of Public Health in Japan represent exactly the actual number of all kinds of death causes, but the names of diseases and organs noted in the post-mortem certificates from which the statistics are made do not seem to be fully reliable, especially names of diseases clinically diagnosed as cancer in the deep internal organs. Recent advances in clinical diagnostic techniques seem, however, to have increased to some extent the reliability of the clinical diagnosis of cancer, and not a few authors attribute to this point the recent increase in the statistics of mortality from the disease. Moreover, advances in the techniques of surgical operation have recently brought about a certain increase in the radical curability of cancer. Thus, in the future, cancers located near to the body surface will become more and more radically curable and death cases will be limited solely to those in the deep internal organs.

2. Statistics in hospitals. By means of the hospital statistics, the number of cancer deaths plus the number of radical cure cases from the disease can be

obtained. However, in this respect also, one should take into account the low reliability of the clinical diagnosis and the inequality of number of statistical materials derived from different hospitals.

3. Statistics of autopsy cases The names of diseases and organs noted in the statistics of autopsy cases are naturally most reliable, but, in the statistics of this kind, radical cure cases are likely to be excluded, the number of autopsy cases of cancer being thus improperly highly evaluated.

In Japan, autopsy is generally executed in the pathological departments of medical colleges and medical schools of universities, using as materials patients who have died mostly in the attached hospitals. Thus, the materials consist one-sidedly of patients dead mostly of internal diseases and partly of unknown causes or exceptional diseases of which the diagnosis was sometimes uncertain or difficult. This fact indicates the inappropriateness of any general statistical evaluation of the incidence of cancer only from the number and the findings of those autopsy materials. The annual number of autopsy cases in all the universities and medical colleges in Japan amounts only to about 3,000.

Inseparable from the various statistics mentioned above, the age distribution of cancer must be taken into consideration. As cancer occurs more frequently in the advanced-age group, the rate of this group to the population as a whole comes into question. The fact that, in Europe and the United States, the rate of the above-60 age group to the population as a whole is almost twice as high as that in Japan seems to be closely related to the fact that cancer cases are reportedly almost two times more frequent in the foregoing areas than in Japan. The recent gradual increase in number of cancer cases all over the world, especially in Japan, seems likewise to have a close relation not only to advances in diagnostic techniques but also to the recent prolongation of the average life span of humans.

Considering the various factors just mentioned, which affect the value of the statistics in question, exact statistics of the real incidence of cancer can only be obtainable 1) by assuring the reliability of the diagnosis, 2) by revising, according to the findings at autopsy, the names of diseases and organs noted in the post-mortem certificates, 3) by noting and considering the number of radical cure cases in the statistics in hospitals and thus, 4) by setting up a corrected rate of occurrence of cancer per 100,000 living of all ages. Only the statistics thus obtained may permit one to compare exactly the rates of occurrence of cancer in different countries where the age constitution of the population varies from one to another, thus serving as a fundamental basis for studies of the geographical pathology of cancer.

The Japan Committee of the International Society of Geographical Pathology

has charged Prof. Katsuo Takeda, one of the members of the Committee, to make a report on "Geographical Pathology of Cancer in Japan", at the 5th general meeting of the Society which is to be held in Washington, September, 1954. Prior to this, the International Committee of the Society had selected Prof. Mitsuo Segi, member of the Committee for the statistics of cancer of the Ministry of Public Health in Japan, to prepare a report on "Statistical Studies of Cancer of the Breast".

The present paper deals with the studies carried out by Prof. Takeda on "Geographical Pathology of Cancer in Japan" from the viewpoint of pathological anatomy. The statistics of causes of death and the statistics in hospitals with regard to cancer in Japan will be presented by Prof. Segi.

II. STATISTICAL STUDY OF CANCER IN JAPAN BASED ON FINDINGS AT AUTOPSY AND BIOPSY

As a help in assessing the real incidence of cancer in Japan, a statistical study has been undertaken, using as materials the data derived from autopsy and biopsy cases executed during the past five years. However, shortage of time and inadequacy of statistical returns make the results far from fully satisfactory.

In order to obtain as great a number of autopsy cases as possible as basis for the statistics and in order to know the local differences in the incidence of cancer, almost all the cases of malignant neoplasms, as confirmed at autopsy during the past five years in the pathological departments of all the universities and medical colleges in Japan were surveyed by means of filling up questionnaires. Additional to this and as a supplementary work to ascertain the incidence of neoplasms in certain internal organs, the biopsy cases of neoplasms during the past three years were similarly surveyed in the medical schools of nine main national universities.

Among the survey cards collected, some individual varieties depending on the reporters were found in the descriptions in the items inquired. Moreover, satisfactory answers could not be obtained in some of the items.

However, it must be mentioned that all the forty-three medical colleges and universities, two hospitals and one charite cooperated in this survey. The present report, which is the first of this kind in Japan to be made from such a great collection of data from autopsy and biopsy cases is utterly due to the good offices and efforts of the authorities of these institutions, to whom the present author wishes to express his earnest and profound gratitude.

Pathological Departments and Professors, cooperated cordially with the Statistics.

Hokkaido University School of Medicine ;	Prof. H. Ambo, Prof. K. Takeda.
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Tokyo Medical Examiners Office ;	Dr. R. Mizuno.
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	rafuku.
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	gawa.
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Mie Prefectural University School of Medi-	
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Nara Prefectural Medical College ;	Prof. H. Sato.

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III. GENERALITIES ON THE MATERIALS USED

As racial differences can be excluded in Japan, all the cancer cases detected in the different districts in Japan were used en bloc as materials. It is recognized, however, that appreciable local differences occur in respect to the mortality from cancer in Japan, but the reasons for these differences are not dealt with in this report.

1. Autopsy cases. Autopsy cases reported in the present survey number 15,006 (from June 1948 to May 1953, except for the charite). This figure corresponds to about one-third of the number of all the death cases in the respective hospitals. Of these 15,006 cases, 4,182 malignant neoplasm cases have been detected (including leukaemia, Hodgkin's disease, etc.). As for the sex distribution of all the autopsy cases, the male to female rate was as 5 : 3.

On the other hand, according to the statistics of the Ministry of Public Health of Japan, malignant neoplasm cases number annually about 64,428 (1950) (table 1). As the actual population of Japan is about 83,200,000 (1950), the death rate from malignant neoplasms per 100,000 living is estimated to be about 77.4 (table 2).

Since, according to the present survey, the number of autopsy cases of malign-

Table 1. Deaths from Cancer, Death Rates per 100,000 Living in 1950 and Autopsy Cases for Five Years (From the Beginning of July, 1948 to the End of June, 1953) Classified According to Sex and Site in Japan, in Accordance with the International Statistical Classification of Diseases, Injuries and Causes of Death, Sixth Revision. (A few Autopsy Cases without Mention of Sex are Omitted from the Table).

Site	Males			Females		
	Deaths in 1950	Death Rates per 100,000 living	Autopsy Cases	Deaths in 1950	Death Rates per 100,000 living	Autopsy Cases
All sites	32,670	39.4		361,758	38.2	
Buccal cavity and pharynx	432	0.52	36	267	0.32	19
140 Lip	17	0.02	—	14	0.02	1
141 Tongue	209	0.25	8	112	0.14	2
142 Salivary Gland	26	0.03	6	19	0.02	4
143 Floor of Mouth	8	—	3	2	—	1
144 Other & Unspecified parts of Mouth	72	0.09	5	48	0.06	3
145 Mesopharynx	15	0.02	3	9	—	2
146 Epipharynx	5	—	7	6	—	—
147 Hypopharynx	1	—	3	4	—	5
148 Other & Unspecified Parts of Pharynx	79	0.10	1	53	0.06	1
Digestive System & Peritoneum	27,132	32.60	1,176	18,152	21.80	434
150 Esophagus	1,961	2.36	98	802	0.97	18
151 stomach	19,023	22.90	656	12,188	14.65	230
152 Small Intestine (including Duodenum)	74	0.09	21	111	0.13	8
153 Large Intestine (excepting Rectum)	620	0.75	22	837	1.01	10
154 Rectum	1,199	1.36	36	1,072	1.29	19
155 Biliary Passage & Liver (Case of Primary Site)	200	0.24	249	176	0.21	107
156 Liver (Metastatic & Unspecified)	3,401	4.12	—	2,402	2.90	—
157 Pancreas	328	0.40	88	198	0.24	38
158 Peritoneum	288	0.35	6	325	0.40	4
159 Unspecified Digestive System	38	0.05	—	41	0.05	—
Respiratory System	1,874	2.27	391	866	1.05	116
160 Nose, Nasal Cavity, Middle ear and Accessory Sinuses	447	0.54	48	286	0.34	18
161 Larynx	575	0.69	43	225	0.31	9

Site	Males			Females		
	Deaths in 1950	Death Rates per 100,000 living	Autopsy Cases	Deaths in 1950	Death Rates per 100,000 living	Autopsy Cases
162 Lung & Bronchus (Primary Site)	15	0.02	276	9	—	85
163 Lung & Bronchus (Un- specified whether Metas- tatic or Primary)	774	0.93	2	321	0.39	1
164 Mediastinum	57	0.07	22	15	0.02	3
165 Other Organs in Tho- rax	6	—	—	10	0.01	—
Breast and Genitourinary System	675	0.81	176	10,496	12.65	610
170 Breast	29	0.03	—	1,419	1.71	82
171 Cervix uteri	—	—	—	505	0.61	215
172 Corpus uteri	—	—	—	88	0.11	33
173 Other Parts of Uterus	—	—	—	187	0.23	81
a Chorionepithelioma	—	—	—	184	0.22	78
b Others	—	—	—	3	—	3
174 Uterus, Not Other wise Specified	—	—	—	7,576	9.12	—
175 Ovary, Oviduct and Wide Ligament	—	—	—	348	0.42	—
a Ovary	—	—	—	346	0.42	68
b Others	—	—	—	2	—	—
176 Other & Unspecified Female Genital Organs	—	—	—	79	0.10	10
177 Prostate	83	0.10	20	—	—	—
178 Testis	46	0.06	38	—	—	—
179 Other & Unspecified Male Genital Organs	92	0.11	14	—	—	—
180 Kidney	114	0.14	53	91	0.11	23
181 Bladder & Other Uri- nary System	311	0.37	51	203	0.24	17
Other & Unspecified Sites	1,365	1.65	244	1,162	1.34	145
190 Malignant Melanoma of Skin	15	0.02	2	14	0.02	1
191 Others of Skin	277	0.33	19	211	0.25	8
192 Eye	46	0.06	4	50	0.06	1
193 Brain & Other Nervous System	45	0.05	118	41	0.05	62
194 Thyroid Gland	26	0.03	8	60	0.07	8
195 Other Endocrine Glands	—	—	12	—	—	6

Site	Males			Females		
	Deaths in 1950	Death Rates per 100,000 living	Autopsy Cases	Deaths in 1950	Death Rates per 100,000 living	Autopsy Cases
196 Bone, including Jaw Bone	226	0.27	23	186	0.22	12
197 Connective Tissues	8	—	12	7	—	8
198 Lymphglands, Metasta- tic & Unspecified	84	0.10	3	65	0.08	1
199 Other & Unspecified Sites	638	0.77	43	528	0.64	38
Lymphatic and Haemato- poietic System	1,192	1.44	512	815	0.98	245
200 Lymphosarcoma & Reticulosarcoma	263	0.32	171	170	0.21	57
201 Hodgkin's Disease	200	0.24	35	132	0.16	8
202 Other Lymphomas (reticuloma)	8	—	—	4	—	—
203 Multiple Myeloma (Plasmacytoma)	1	—	6	1	—	1
204 Leukaemia & Aleu- kaemia	718	0.87	300	508	0.61	178
205 Granuloma Fungoides	2	—	—	—	—	1

nant neoplasms is 836 per year (4,182 divided by 5), 1.3 per cent of all the malignant neoplasm cases is assumed to be subjected to autopsy. However, the actual number of death cases from malignant neoplasms is considered, for reasons mentioned later, to be appreciably greater than is represented in the statistics of causes of death by the Ministry of Public Health; this percentage may be reduced to about 1 per cent. When taken separately according to the kinds of organs, this percentage, however, varies considerably as shown in table 3. The reason for the extremely high percentage of cancer of the lung as presented in this table will be mentioned in the corresponding chapter. In reality, this percentage seems not to be so high as is represented in the table.

2. Biopsy cases. For the purpose of correcting the one-sidedness of the result obtained from the autopsy cases and of supplementing the shortage of data, the result obtained from the biopsy cases surveyed in the nine universities as mentioned above (from June 1950 to May 1953), was added to the materials for the statistics. As biopsy is principally executable for neoplasms located near to the body surface, the statistical figures obtained from the biopsy cases were found, as a whole, to be in reverse to those obtained from the autopsy cases in

which mostly the deep internal organs are to be examined. The result is presented in table 4.

Table 2. Population in Japan by Age and Sex (1950).

Age group	Males (%)	Females (%)	Both sexes (%)
0- 4	5,715,000 (14.0)	5,488,000 (12.9)	11,203,000 (13.5)
5- 9	4,834,000 (11.9)	4,709,000 (11.1)	9,541,000 (11.5)
10-14	4,405,000 (10.8)	4,310,000 (10.1)	8,715,000 (10.5)
15-19	4,306,000 (10.6)	4,243,000 (10.0)	8,549,000 (10.2)
20-24	3,815,000 (9.4)	3,899,000 (9.2)	7,714,000 (9.2)
25-29	2,811,000 (6.9)	3,354,000 (7.9)	6,165,000 (7.4)
30-34	2,349,000 (5.8)	2,840,000 (6.8)	5,188,000 (6.2)
35-39	2,375,000 (5.8)	2,677,000 (6.4)	5,051,000 (6.1)
40-44	2,207,000 (5.4)	2,278,000 (5.4)	4,484,000 (5.4)
45-49	2,017,000 (4.9)	1,983,000 (4.7)	4,000,000 (4.8)
50-54	1,721,000 (4.2)	1,674,000 (3.9)	3,396,000 (4.1)
55-59	1,375,000 (3.3)	1,368,000 (3.2)	2,743,000 (3.3)
60-64	1,109,000 (2.7)	1,196,000 (2.8)	2,304,000 (2.8)
65-69	800,000 (2.0)	972,000 (2.3)	1,772,000 (2.1)
70-79	807,000 (2.0)	1,157,000 (2.7)	1,964,000 (2.4)
80 and upwards	129,000 (0.3)	247,000 (0.6)	377,000 (0.5)
All ages	40,791,000 (100.0)	42,409,000 (100.0)	83,200,000 (100.0)
% by sex to the whole population	(49.0)	(51.0)	(100.0)

Table 3. Percentage of the Autopsy Cases Found to the Total Cases of Cancer in the Different Organs Designated by the Society of Geographical Pathology.

Cancer by organ	A: Autopsy cases	B: Annual death cases	Percentage of A to B
Cancer of the breast	82/5	1,448	1.1
Cancer of the uterus	245/5	8,169**	0.6
Cancer of the lung	351/5	1,119**	6.2
Cancer of the liver	356/5	6,179**	1.1
Cancer of the stomach	960/5	31,211	0.6
Others	2,189/5***	16,302	2.7
All cases	4,182/5	64,428	1.3

* Statistics by the Ministry of Public Health, 1950.

** These figures include cases in which the primary sites were not apparent.

*** This figure includes all other malignant neoplasms such as cancers of other organs, sarcomas, leukaemia, Hodgkins disease etc.

Table 4. Biopsy Cases of Cancer as Reported in the Survey.

Total number of biopsy cases	29,768
Total number of malignant neoplasm cases found in which	6,930 (23%)
Cancer of the breast	678
Cancer of the uterus	1,889
Cancer of the stomach,	1,230
Others (including cancers of other organs, sarcomas, leukaemia etc.)	3,133

IV. CONSIDERATION ON THE EXISTING STATISTICAL STUDIES ON CANCER AS COMPARED WITH THE PRESENT STUDY

Since Yamagiwa (1889), a variety of statistical studies of malignant neoplasms, especially of cancer, based on autopsy materials have been reported in Japan. An ample study dealing with cancer as a whole in different organs was reported in the 17 references presented in table 5. Most of these studies were made respectively on the basis of more than 1,000 autopsy materials, in different periods from 1889 to 1952 and in various districts such as Tokyo, Kyoto, Fukuoka, Niigata, Sendai, and Sapporo.

I. Frequency of cancer (table 5).

The rate of frequency of malignant neoplasms to the total number of autopsy cases varies from 11.6 per cent to 28.2 per cent, according to the reporters (18.2 %, on an average).

Cancer cases are generally found in 77.5-90.5 per cent of all the malignant neoplasm cases autopsied (83.1% on an average), and in 7.7-25.5 per cent of all the autopsy cases in general (13.0% on an average).

According to the present statistics, malignant neoplasm cases were found at a rate as high as 27.9 per cent to the total number of autopsy cases. Even if leukaemia, Hodgkin's disease and some others not included in the existing statistics are excluded from the present statistics, the rate is still as high as 19.3 per cent. This may not mean, however, a real increase in frequency of cancer cases; it must be taken into account that recently, in Japan, autopsy cases of tuberculosis, which previously made up 20-30 per cent, in general are tending to decrease remarkably in number.

Now, to sum up the existing data reported before the year of 1935, 3,497 cancer cases are found in the total autopsy cases of 27,511, giving 12.7 ± 0.20 per cent. After 1935, 2,242 cancer cases are found in 16,487 autopsy cases in total, giving 13.6 ± 0.3 per cent. The difference between the two rates has, however, no statistical significance.

Table 5. Frequency of Cancer and Other Malignant Neoplasms.

No. Reporters.	Surveyed districts	Period of survey	Total number of autopsy cas. (A)	Malignant peopl.		Cancer		
				number (B)	% to A	number	% to A	% to B
1. Yamagiwa	Tokyo	1889-1902	3,076			237	7.7	
2. Ishibashi & Takatsu	Tokyo	1894-1914	7,485			812	10.85	
3. Suzuki	Kyoto	1901-1915	2,810	479	17.05	378	13.45	79.0
4. Ohno	Fukuoka	1905-1915	2,017	431	21.4	339	16.8	78.7
5. Harada	Tokyo	1911-1921	676			134	19.82	
6. Nagayo	Tokyo	1915-1932	4,592			767	16.70	
7. Nagayo*	Tokyo	1894-1932	12,077			1,579	13.07	
8. Tanaka (Ch.)	Niigata	1912-1932	1,760	239	13.6	204	11.6	85.4
9. Oka	Kyoto	1901-1935	5,095			626	12.29	
10. Itoh	Tokyo	1924-1936	1,188	183	15.4	164	13.8	89.6
11. Kimura	Tokyo	1924-1936	1,187	208	17.5	166	13.9	79.8
12. Hanada & Murakami	Sapporo	1922-1937	1,402	344	24.54	244	17.40	70.9
13. Kawachino	Tokyo	1921-1938	1,643	321	19.5	263	16.0	82.0
14. Tanaka (K.)	Fukuoka	1930-1947	(3,922)	544	13.87	477	12.16	87.7
15. Abe	Sendai	1920-1948	4,618	644	13.95	532	11.52	82.61
16. Shimada	Niigata	1936-1948	1,505	174	11.6	135	9.0	77.5
17. Tanaka & Enjoji	Fukuoka	1947-1952	1,022	288	28.2	261	25.5	90.5
Before 1935 (No. 1-9)			27,511**			3,497	12.7	
After 1935 (No. 10-17)			16,487			2,242	13.6	
Total (No. 1-17)			43,998**			5,739	13.0	
18. Takeda	All Japan	1948-1953	15,006	4,182***	27.9	2,887	19.3	69.9

* The number of cases treated in report 7 is the sum of 2 and 6.

** Report 7 excluded.

*** Cases of leukaemia and Hodgkin's disease are included in this figures.

Table 6. Frequency of Cancer by Sex
(Reports by Yamagiwa and Kimura Excluded).

No. Reporters	Total num. of cancer cases	Number of cancer cases Male in Females to female rate			Per cent to autopsy cases by sex	
		Males (%)	Females (%)		Male	Female
1. Ishibashi & Takatsu	812	567 (69.8)	245 (30.2)	2.3/1	11.65	9.50
2. Suzuki	378	228 (60.2)	150 (39.8)	1.5/1	13.55	13.31
3. Ohno	339	243 (71.6)	96 (28.4)	2.5/1	18.9	13.1
4. Harada	134	90 (67.2)	44 (32.8)	2.1/1	21.63	11.28
5. Nagayo	767	537 (70.0)	230 (30.0)	2.3/1	17.99	14.41
6. Nagayo*	1,579	1,104 (70.1)	475 (29.9)	2.3/1	14.32	10.93
7. Tanaka (Ch.)	204	119 (53.8)	85 (41.2)	1.4/1	10.8	12.9
8. Oka	626	402 (64.2)	224 (35.8)	1.8/1	12.98	11.28
9. Itoh	164	106 (64.7)	58 (35.3)	1.8/1	15.3	
10. Hanada & Murakami	244**	157 (64.5)	86 (35.2)	1.8/1	18.13	17.00
11. Kawachino	263	149 (56.6)	114 (43.4)	1.3/1	15.0	17.5
12. Tanaka (K.)	477	331 (69.4)	146 (30.6)	2.3/1		
13. Abe	532	328 (61.65)	204 (38.35)	1.6/1	12.18	10.60
14. Shimada	135	69 (51.1)	66 (48.9)	1.05/1	7.3	11.9
15. Tanaka & Enjoji	261	157 (60.2)	104 (39.8)	1.5/1		
Before 1935 (No. 1-8)	3,260	2,186 (67.2)	1,074 (32.8)	2.2/1		
After 1935 (No. 9-15)	2,076	1,297 (62.5)	778 (37.5)	1.7/1		
Total (No. 1-15)	5,336	3,483 (65.1)	1,852 (34.5)	1.9/1		
16. Takeda	2,887***	1,776 (62.0)	1,088 (38.0)	1.5/1		

* The number of cases treated in report 6 is the sum of 1 and 5.
This was excluded from the total sum.

** This figure contains one case without mention of sex.

*** This figure contains 14 cases without mention of sex.

Table 7. Frequency of Cancer in Different Organs (Both Sexes Altogether).

No. Reporters	Surv. distr.	Total numb. of canc. cas. (A) (% to all autop. cas.)	Canc. of the breast Number (% to A)	Canc. of the uterus Number (% to A)	Cancer 1 of the lung Number (% to A)	Cancer 2 of the liver Number (% to A)	Cancer of the stomach Number (% to A)
1. Yamagiwa	Tokyo	237 (7.7)	5 (2.1)	10 (4.2)	8 (3.37)	23 (9.7)	107 (45.1)
2. Ishibashi & Takatsu	Tokyo	812 (10.85)	12 (1.46)	41 (5.05)	33 (4.70)	53 (6.53)	355 (44.0)
3. Suzuki	Kyoto	378 (13.45)	12 (3.1)	44 (11.5)	7 (1.8)	21 (5.5)	135 (35.4)
4. Ohno	Fukuoka	339 (16.8)	4 (1.2)	25 (7.4)	8 (2.4)	55 (16.2)	133 (39.2)
5. Harada*	Tokyo	134 (19.82)	3 (2.24)	2 (1.49)	6 (4.48)	16 (11.94)	65 (48.51)
6. Nagayo	Tokyo	767 (16.70)	11 (1.43)	27 (3.51)	53 (6.91)	53 (6.91)	319 (41.59)
7. Nagayo**	Tokyo	1,579 (13.07)	23 (1.46)	68 (4.36)	86 (5.45)	106 (6.71)	674 (42.68)
8. Tanaka (Ch.)	Niigata	204 (11.6)	4 (2.0)	15 (7.4)	13 (6.4)	14 (6.8)	81 (39.7)
9. Oka	Kyoto	626 (12.29)	16 (2.56)	39 (6.23)	12 (1.92)	61 (9.74)	230 (36.74)
10. Itoh	Tokyo	164 (13.8)	7 (4.3)	9 (5.5)	9 (5.5)	13 (7.9)	72 (43.9)
11. Hanada & Murakami	Sapporo	244 (17.40)	7 (2.87)	22 (9.02)	19 (7.79)	30 (12.30)	97 (39.75)
12. Kawachino	Tokyo	263 (16.0)	7 (2.7)	43 (16.3)	10 (3.8)	18 (6.8)	94 (35.7)
13. Tanaka(K.)	Fukuoka	477 (12.16)	6 (1.3)	40 (9.0)	31 (6.5)	43 (9.0)	180 (37.7)
14. Abe	Sendai	532 (11.52)	8 (1.50)	59 (11.09)	30 (5.64)	36 (6.77)	176 (33.08)
15. Shimada	Niigata	135 (9.0)	2 (1.5)	14 (10.4)	20 (14.8)	6 (4.4)	47 (34.8)
16. Tanaka & Enjoji	Fukuoka	261 (25.5)	6 (2.3)	41 (15.7)	25 (9.5)	28 (10.7)	73 (27.6)
Before 1935 (No. 1-9)		3,497 (12.7)	67 (1.9)	203 (5.3)	140 (4.0)	296 (8.5)	1,425 (40.6)
After 1935 (No. 10-16)		2,076 (13.6)	43 (2.1)	228 (10.9)	144 (6.9)	174 (8.4)	739 (35.6)
Total (No. 1-16)		5,573 (13.0)	110 (1.97)	431 (7.77)	284 (5.10)	470 (8.43)	2,164 (38.79)
17. Takeda	All Japan	2,887 (19.3)	82 (2.8)	245 (8.5)	351 (12.6)	218 (7.6)	960 (33.2)

* Report 5 containing only a few cases of uterine cancer is of a military medical school.

** Number of cases treated in report 7 is the sum of 2 and 6. This was excluded from the total sum.

1. Cancer of the bronchus was excluded in some reports.

2. In all the reports, the corresponding figures contain the cancer cases of the intrahepatic bile ducts.

Table 8. Frequency of Cancer in Different Organs in Males
(Reports by Yamagiwa and Kimura Excluded).

No. Reporters	Surv. distr.	Number of male corpses at autop. (A)	Number of canc. cas. in males (B) (% to A)	Cancer of the breast Number (% to B)	Cancer of the lung Number (% to B)	Cancer of the liver Number (% to B)	Cancer of the Stomach Number (% to B)
1. Ishibashi & Takatsu	Tokyo	4,725	567 (11.65)	4 (0.75)	24 (4.21)	42 (7.40)	284 (50.0)
2. Suzuki	Kyoto		228 (13.55)	1 (0.4)	5 (2.2)	20 (8.7)	95 (41.6)
3. Ohno	Fukuoka	1,286	243 (18.9)	0 (0.0)	8 (3.3)	49 (20.2)	107 (44.0)
4. Harada	Tokyo		90 (21.63)	0 (0.0)	5 (5.56)	13 (14.14)	44 (48.89)
5. Nagayo	Tokyo	2,985	537 (17.99)	1 (0.19)	35 (6.52)	44 (8.19)	242 (45.07)
6. Nagayo*	Tokyo	7,710	1,104 (14.32)	5 (0.45)	59 (5.34)	86 (7.79)	526 (47.64)
7. Tanaka (Ch.)	Niigata		119 (10.8)	0	11 (9.2)	10 (8.4)	47 (39.5)
8. Oka	Kyoto	3,430	402 (12.93)	1 (0.3)	9 (2.2)	51 (12.7)	158 (39.3)
9. Itoh	Tokyo	692	106 (15.3)	0	7 (6.6)	11 (10.4)	47 (44.9)
10. Hanada & Murakami	Sapporo	866	157 (18.13)	0	15 (9.55)	23 (15.29)	68 (43.31)
11. Kawachino	Tokyo		149 (15.0)	0	9 (6.0)	14 (9.4)	65 (43.6)
12. Tanaka(K.)	Fukuoka		331	0	26 (7.9)	36 (10.8)	140 (42.3)
13. Abe	Sendai	2,693	328 (12.18)	1 (0.3)	28 (8.54)	27 (8.25)	124 (37.8)
14. Shimada	Niigata	960	69 (7.3)	0	12 (17.4)	6 (8.7)	26 (37.7)
15. Tanaka & Enjoji	Fukuoka		157	0	21 (13.4)	24 (15.3)	51 (32.5)
Before 1935 (No. 1-8)			2,186	7 (0.3)	97 (4.4)	229 (10.4)	978 (44.7)
After 1935 (No. 9-15)			1,297	1 (0.1)	118 (9.2)	141 (10.9)	521 (40.2)
Total (No. 1-15)			3,483	8 (0.2)	215 (6.2)	370 (10.6)	1,499 (42.9)
16. Takeda	All Japan		1,776	0	273 (15.4)	167 (9.4)	653 (36.8)

* The number of cases treated in report 6 is the sum of 1 and 5.
This was excluded from the total sum.

Table 9. Frequency of Cancer in Different Organs in Females
(Reports by Yamagiwa and Kimura Excluded).

No. Reporters	Surv. distinct.	Numb. of female corpses at autop. (A)	Numb. of cancer cases in females (B) (% to A)	Cancer of the breast.	Canc. of the uterus.	Canc. of the lung.	Canc. of the liver.	Canc. of the stomach.
				Number (% to B)	Number (% to B)	Number (% to B)	Number (% to B)	Number (% to B)
1. Ishibashi & Takatsu	Tokyo	2,760	245 (9.50)	8 (3.28)	41 (16.80)	9 (3.72)	11 (4.50)	71 (29.10)
2. Suzuki	Kyoto		150 (13.31)	11 (7.3)	44 (29.3)	2 (1.4)	1 (0.7)	32 (26.0)
3. Ohno	Fukuoka	731	96 (13.1)	4 (4.2)	25 (26.0)	0	6 (6.2)	26 (27.1)
4. Harada*	Tokyo		44 (16.93)	3 (6.82)	2 (4.55)	1 (2.27)	3 (6.82)	21 (47.73)
5. Nagayo	Tokyo	1,596	230 (14.41)	10 (4.35)	27 (11.74)	18 (7.83)	9 (3.91)	77 (33.48)
6. Nagayo**	Tokyo	4,356	475 (10.93)	18 (3.79)	68 (14.32)	27 (5.68)	20 (4.21)	148 (31.11)
7. Tanaka (Ch.)	Niigata		85 (12.9)	4 (4.7)	15 (26.0)	2 (2.4)	4 (4.7)	34 (40.00)
8. Oka	Kyoto	2,261	224 (11.28)	15 (6.7)	39 (17.4)	3 (1.3)	10 (4.5)	72 (32.2)
9. Itoh	Tokyo	492	58 (11.8)	7 (12.1)	9 (15.5)	2 (3.4)	2 (3.4)	25 (43.1)
10. Hanada & Murakami	Sapporo	506	86 (17.00)	7 (8.14)	22 (25.58)	4 (4.65)	7 (8.14)	29 (33.72)
11. Kawachino	Tokyo		114 (17.5)	7 (6.1)	43 (37.7)	1 (0.9)	4 (3.5)	29 (25.4)
12. Tanaka(K.)	Fukuoka		146	6 (4.1)	40 (27.4)	5 (3.4)	7 (4.8)	40 (27.4)
13. Abe	Sendai	1,925	204 (10.60)	7 (3.43)	59 (28.92)	2 (0.98)	9 (4.41)	52 (25.49)
14. Shimada	Niigata	544	66 (11.9)	2 (3.0)	14 (21.2)	8 (12.1)	0	21 (31.8)
15. Tanaka & Enjoji	Fukuoka		104	6 (5.8)	41 (39.4)	4 (3.8)	4 (3.8)	22 (21.2)
Before 1935 (No. 1-8)			1,074	55 (5.1)	207 (19.3)	35 (3.3)	44 (4.1)	340 (31.6)
After 1935 (No. 9-15)			778	42 (5.4)	214 (29.7)	26 (3.3)	33 (4.2)	216 (28.0)
Total (No. 1-15)			1,852	97 (5.2)	421 (22.8)	61 (3.3)	77 (4.2)	558 (30.1)
16. Takeda	All Japan		1,088	81 (7.5)	245 (22.6)	77 (7.1)	51 (4.7)	299 (27.5)

* Report 4 containing only a few cases of uterine cancer is of a military medical school.

** The number of cases treated in report 6 is the sum of 1 and 5.
This was excluded from the total sum.

II. Sex distribution of cancer (table 6).

Putting together the existing reports, cancer is found more frequently in men than in women in every case; the male to female rate in frequency of the disease is as 2.2 : 1 before 1935 and as 1.7 : 1 after 1935, being averaged as 1.9 : 1. Likewise, in comparison according to sex, the death rate from cancer to the total number of deaths is higher in men than in women, giving 13.7 per cent for men and 11.9 per cent for women.

In the present statistics, the men to women rate of cancer cases is as 1.5 : 1, but, if corrected by the men to women autopsy rate of 5 : 3 as mentioned above, the rate is estimated to be almost the same for both sexes.

III. Frequency of cancer in important organs (tables 7, 8, 9).

1. **Cancer of the breast:** For both sexes together, cancer of the breast was reported to be found in 1.97 per cent of all the cancer cases and in 0.28 per cent of the autopsy cases as a whole.

Reports on cancer of the breast in men were extremely rare. In women, mammary cancer cases represent 5.2 per cent of all kinds of cancer cases, corresponding to about one-fourth of the number of uterine cancer cases detected within the same period of time. No appreciable difference was noted before and after 1935.

In the present statistics, cancer of the breast was found in 0.55 per cent of all the autopsy cases, in 2.8 per cent of the autopsy cases of malignant neoplasms and in 7.5 per cent of all kinds of cancer cases in women. These rates are relatively higher than the existing rates.

2. **Cancer of the uterus:** The frequency of cancer of the uterus is 7.7 per cent of all the cancer cases, 1.01 per cent of all the autopsy cases in general and 22.8 per cent of the cancer cases in women. The last rate was 19.3 per cent before 1935 and 29.7 per cent after 1935, showing an increase after 1935. In most of the reports, cancer of the uterus occupies the second place, next to cancer of the stomach in women. In some reports, the former occupies the first place or is at the same level as the latter.

In the present statistics, cancer of the uterus was found in 1.63 per cent of all the autopsy cases, in 8.5 per cent of the cancer cases as a whole and in 22.6 per cent of the cancer cases in women. These rates are almost equal to the corresponding existing rates, but lower than those evaluated after 1935.

3. **Cancer of the lung:** For both sexes together, cancer of the lung occupies 5.10 per cent of all the cancer cases and 0.66 per cent of all the autopsy cases in general. The former rate is 4.4 ± 0.33 per cent before 1935 and 6.9 ± 0.56 per cent after 1935, showing an increase up to the present day. Especially in men, being 6.2 per cent on an average through all the period, the rate is 4.4 ± 0.44 per

cent before 1935 and 9.2 ± 0.80 per cent after 1935, thus showing an increase in the later period. Through the whole period, pulmonary cancer cases in women are found on an average in 3.3 per cent of the cancer cases, without presenting any appreciable difference before and after 1935.

In the present statistics, cancer of the lung was found in 2.3 per cent of the total number of autopsy cases and in 12.6 per cent of the total autopsy cases of cancer. These rates are considerably high, as compared with the existing similar rates of 0.66 and 5.1 per cent respectively. Compared separately by sex, the newly established present rate is 15.4 per cent for men and 7.1 per cent for women, showing a recent increase in number of lung cancer cases, especially in men.

4. Cancer of the liver: For both sexes together, cancer of the liver is found in 8.4 per cent of the whole number of cancer cases and in 1.1 per cent of all the autopsy cases. In nearly all of the reports, intrahepatic bile duct cancer and liver cell cancer are treated as one, but gall bladder cancer and extrahepatic bile duct cancer are separately reported.

Cancer of the liver, in the existing reports, is in frequency next to cancer of the stomach or to cancer of the other digestive organs. In men, cancer of the liver is found in 10.6 per cent of all kinds of cancer cases. This rate is particularly high in Kyushu district. In women, it is found in 4.2 per cent of all kinds of cancer cases. Thus, in women, hepatic cancer cases are reported to be less than half of the cases in men. There is no difference according to sex, before and after 1935.

In the present statistics, liver cell cancer cases were 194, biliary cancer cases 162, totaling 351. This number represents 2.4 per cent of all the autopsy cases in general and 12.3 per cent of the cancer cases as a whole. However, if limited to 194 cases of liver cell cancer and 24 cases of intrahepatic bile duct cancer, totaling 218 cases, the rate is 1.5 per cent for the autopsy cases as a whole and 7.6 per cent for the cancer cases as a whole. These rates are seemingly lower than the existing rates.

5. Cancer of the stomach: For both sexes, cancer of the stomach is found in 38.8 per cent of the whole number of cancer cases and 5.1 per cent of all the autopsy cases, thus being placed, in all the reports, at the top of all kinds of cancer. In men, cancer of the stomach is more frequent than in women, showing a rate as high as 42.9 per cent and being always at the top. In women, cancer of the stomach represents 30.1 per cent of the cancer cases as a whole, being almost always at the top.

Before 1935, gastric cancer cases occupy 40.8 per cent of all kinds of cancer cases, and after 1935, 35.6 per cent. This decrease in frequency may be ascribed

to the fact, that, following the recent increase in number of autopsy cases of pulmonary and uterine cancer, the frequency of autopsy of gastric cancer is tending to decrease in comparison with the number of autopsy cases of cancer as a whole. This tendency is observed both in men and in women.

In the present statistics, cancer of the stomach represents 6.4 per cent of the autopsy cases in general, surpassing the existing rate of 5.1 per cent, but, the rate to the whole number of cancer cases, the similar separate rates in men and in women are lower than the existing rates, being 33.2 per cent, 36.8 per cent and 27.5 per cent respectively. Nevertheless, cancer of the stomach remains still at the top of all kinds of cancer.

Va. CANCER OF THE BREAST

Eighty-two autopsy cases and 678 biopsy cases, totaling 760 cases, were examined en bloc. 731 biopsy cases of benignant neoplasms of the breast served as controls.

Sex. Cancer of the breast was detected incomparably more frequently in females than in males, the rate of occurrence being 97.8 per cent for the former (735 cases) and 2.2 per cent for the latter (14 cases) as shown in table 10. For that reason, the following data were obtained from the cases in females.

Table 10. Sex Distribution of Cancer of the Breast.

Sex	Number of cases (%)
Females	735 (97.8)
Males	14 (2.2)
Both sexes	749 (100.0)

Age. As shown in table 11, cancer was found to be most frequent in the 40-54 age group. More than 50 per cent of all the cases was found in this age group.

Table 11. Age Distribution of Cancer of the Breast.

Age group	Number of cases	Per cent	Age group	Number of cases	Per cent
10-14	1	0.1	45-49	124	17.8
15-19	3	0.3	50-54	97	13.8
20-24	4	0.5	55-59	63	9.1
25-29	25	3.4	60-64	44	6.3
30-34	54	7.9	65-69	35	5.0
35-39	82	11.7	70-74	18	2.6
40-44	147	21.2	75-79	1	0.1
			All ages	698	100.0

Site. In accordance with the existing theory, cancer of the left breast seemed somewhat more frequent in occurrence than that of the right, the rate being respectively 52 per cent (314 cases) and 45.8 per cent (276 cases). Simultaneous bilateral cases were limited to only 2.2 % (14 cases), as seen in table 12.

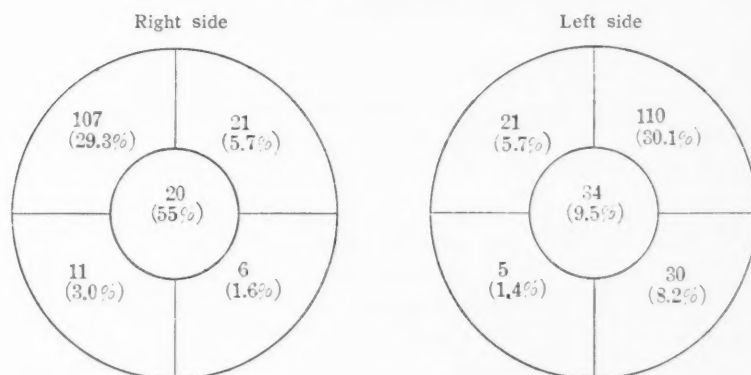
Table 12. Site of Occurrence of Cancer of the Breast Classified According to Sex.

Sex	Number of cases (%) in			
	Right side	Left side	Both sides	All sides
Females	276 (45.8)	314 (52.0)	14 (2.2)	604 (100.0)
Males	2 (15.4)	11 (84.6)	0	13* (100.0)
Both sexes	278 (45.2)	325 (52.5)	14 (2.2)	617 (100.0)

* One case without mention of side is omitted.

Location. On both sides, the superior-exterior quadripartite was the site of preference (left: 110 cases representing 30.1 %; right: 107 cases representing 29.3 %). Among others, the inferior-interior one was the least preferable (table 13). A statistically significant difference was noticed in preference between the different quadripartites.

Table 13. Location of Cancer of the Breast in Females in Different Quadripartites of the Breast with Number of Cases and its Percentage Noted in the Corresponding Partite.



Histological types. The histological findings were classified as presented in table 14. As noticed in this table, undifferentiated alveolar type seemed to be relatively less frequent than the other 2 main types. As for the age distribution of the histological types, differentiated adenomatous type and undifferentiated alveolar type were frequent in the 40-44 age group, while undifferentiated diffuse

infiltrative type was rather frequent in the 45-54 age group (table 15).

Macroscopic findings. Macroscopically, nodular form is much more frequent (275 cases, 85 %) than scirrhou form (36 cases, 11 %).

As for the relationship between the histological and macroscopic findings, undifferentiated diffuse infiltrative type was more frequent in scirrhou form than differentiated adenomatous type, while, in nodular form, these two types were found almost equally. Undifferentiated alveolar type was less frequent in nodular form (table 16).

Table 14. Frequency of the Histological Types of Cancer of the Breast.

Cancer types	Number of cases	Per cent
Carcinoma in situ	8	1.1
Differentiated adenomatous types	215	32.9
Undifferentiated alveolar types	153	24.2
Undifferentiated diffuse infiltrative types	217	33.3
Mucous types	27	4.0
Squamous types	24	3.7
Sarcoma	5	0.8
All types	654	100.0

Metastasis. Metastasis was found in 70 per cent of the autopsy cases. Histologically, the metastasis of the differentiated type seemed to be less frequent than that of the undifferentiated types (64.3 % to 74.4 %) (table 17). The sites of metastasis are arranged as follows in order of its frequency: lymph nodes, lung, liver, pleura and bones.

Cancer of the breast in males. Additional to the preceding study, 14 cases of breast cancer found in males were examined. The data obtained were almost in accordance with those obtained in females, except for the age distribution which remained undetermined.

Of the questionnaires concerning cancer of the breast, the relationship of the disease to marriage, pregnancy, births, breast feeding, duration of lactation, religion, custom, economical and social status and average age at first menstruation could not be obtained, because of the lack of sufficient descriptions in the items concerned.

Vb. BENIGN NEOPLASMS OF THE BREAST

As a help for seeking for the precursors of malignancy of cancer of the breast, biopsy cases of benign neoplasms of the breast were examined. Of 731 cases in total, 670 cases (91.7 %) were found in females, 61 cases (8.3 %) in males (table 18). They are more frequent on the left side than on the right side (table 19).

The location of preference of the diseases was the superior-exterior quadripartite on both sides of the breast, just in accordance with that of malignant neoplasms (table 20). Histologically, fibroadenoma was found in 70.5 per cent (516 cases) of the cases, followed by 27.7 per cent (203 cases) of mastopathia chronica cystica

Table 15. Age Distribution of Cancer and Benign Neoplasms of the Breast Classified According to the Histological Types.

Age groups	Number of cases (%) of						
	Cancer of the breast in				Benign Neoplasms of the breast in		
	All cases*	Dif. aden. type	Undif. alv. type	Undif. dif. infiltr. type	All cases**	Fibro-aden.	Mastop. chron. cyst.
10-14	1 (0.1)	1 (0.5)	0	0	2 (0.3)	2 (0.5)	0
15-19	3 (0.3)	1 (0.5)	1 (0.7)	0	17 (2.7)	12 (2.7)	5 (2.8)
20-24	4 (0.5)	3 (1.6)	1 (0.7)	0	72 (11.5)	61 (13.9)	11 (6.2)
25-29	25 (3.4)	6 (3.1)	8 (5.4)	6 (2.7)	76 (12.2)	58 (13.4)	17 (9.5)
30-34	54 (7.9)	15 (7.5)	10 (6.8)	17 (8.1)	109 (17.5)	87 (19.8)	22 (12.3)
35-39	82 (11.7)	31 (14.5)	16 (10.9)	21 (10.0)	117 (18.7)	79 (18.0)	37 (20.6)
40-44	147 (21.2)	41 (20.1)	35 (23.8)	37 (17.6)	107 (17.1)	60 (13.7)	43 (24.0)
45-49	124 (17.8)	33 (16.4)	26 (17.7)	40 (19.1)	78 (12.5)	50 (11.4)	27 (15.1)
50-54	97 (13.8)	24 (11.9)	20 (13.6)	39 (18.6)	33 (5.3)	19 (4.3)	12 (6.7)
55-59	63 (9.1)	20 (9.9)	10 (6.8)	18 (8.6)	4 (0.6)	1 (0.2)	3 (1.7)
60-64	44 (6.3)	13 (6.5)	8 (5.4)	17 (8.1)	6 (0.9)	6 (1.4)	0
65-69	35 (5.0)	11 (5.5)	10 (6.8)	10 (4.8)	4 (0.6)	2 (0.5)	2 (1.1)
70-74	18 (2.6)	4 (2.0)	2 (1.4)	5 (2.4)	0	0	0
75-79	1 (0.1)	0	0	0	0	0	0
80 and upwards	0	0	0	0	1 (0.1)	1 (0.2)	0
All ages	698 (100.0)	203 (100.0)	147 (100.0)	210 (100.0)	626 (100.0)	438 (100.0)	179 (100.0)

*, ** The figures in these columns include some cases which were not treated in the following columns.

Table 16. Relationship between the Histological Types and the Macroscopical Forms of Cancer of the Breast.

Types	Number of cases in			
	Scirrhus form	Nodular form	Other forms	All forms
Differentiated adenomatous type	8	81	1	90
Undifferentiated alveolar type	10	59	2	71
Undifferentiated diffuse infiltrative type	13	81	8	107
Other types	5	54	1	60
All types (%)	36 (11.1)	275 (85.0)	12 (3.9)	323 (100.0)

Table 17. Feature of Metastasis of Cancer of the Breast.

Types	With metastasis (%)	Without metastasis (%)	All cases (%)
Differentiated adenomatous types	70 (64.3)	39 (35.7)	109 (100.0)
Undifferentiated type	153 (74.4)	53 (25.6)	206 (100.0)
in which alveolar type	63 (75.0)	21 (25.0)	84 (100.0)
diffuse infiltrative type	90 (73.8)	32 (26.2)	122 (100.0)
Other types	35 (72.9)	13 (27.1)	48 (100.0)
All types	258 (70.6)	105 (29.4)	363 (100.0)

Table 18. Sex Distribution of Benign Neoplasms of the Breast.

Sex	Number of cases (%)
Females	670 (91.7)
Males	61 (8.3)
Both sexes	731 (100.0)

Table 19. Site of Occurrence of Benign Neoplasms of the Breast.

Sex	Number of cases (%) on			
	Right side	Left side	Both sides	Totals
Females	250 (42.3)	294 (50.0)	45 (7.7)	589 (100.0)
Males	17 (34.7)	29 (59.2)	3 (6.1)	49 (100.0)
Both sexes	267 (41.8)	323 (50.7)	48 (7.5)	638 (100.0)

Table 20. Location of Preference of Benign Neoplasms of the Breast in Females.

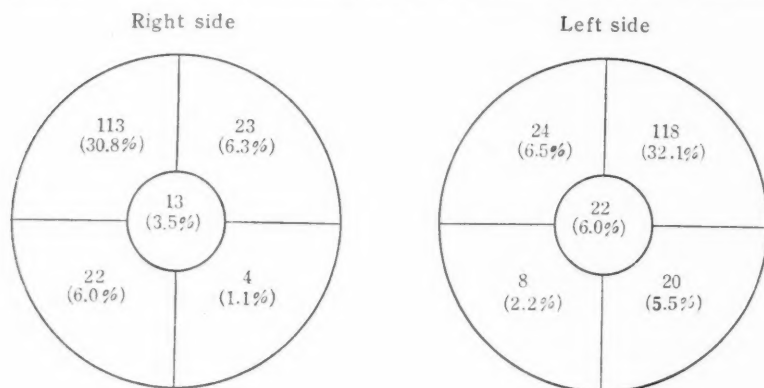


Table 21. Frequency of the Histological Types Benign Neoplasms of the Breast.

Sex	Number of cases (%) in			
	Fibroadenoma	Mastopathia chronica cystica	Papilloma	All types
Females	472 (70.5)	189 (28.2)	9 (1.3)	670 (100.0)
Males	44 (72.1)	14 (23.0)	3 (4.9)	61 (100.0)
Both sexes	516 (70.6)	203 (27.7)	12 (1.7)	731 (100.0)

and 1.8 per cent (12 cases) of papilloma. It must be mentioned that, according to reporters, some individual differences were noticed in the criteria of the findings of mastopathia chronica (table 21).

As for the age distribution of the diseases, fibroadenoma tends to occur rather in young adults (30-39) as compared with cancer of the breast (40-49), while mastopathia chronica is so in the 35-44 age group (table 15).

The fact that, in the sex distribution, the site of occurrence and the location of preference, fibroadenoma, mastopathia chronica and cancer of the breast are equal to one another, with an apparent displacement in the age distribution, may suggest to one the existence of a correlation between those three kinds of diseases. In this connection, Prof. Kuru has insisted on the existence of a close relation between cancer of the breast and mastopathia, thus taking the latter as a precancerous state to the former. According to Kuru, the displacement of 5 years of age from the 40-45 age group to the 45-50 age group as noticed in the incidences of the two diseases would be the period of shifting from the precancerous state to genuine cancer.

CONCLUSION

Even considering the fact that the rate of the advanced age group to the population as a whole in Japan is less than half of that in Europe and the United States, the rate of occurrence of cancer of the breast in Japan is assumed to be much lower than that in those countries.

Whether or not this is due to the frequency of breast feeding or the prolongation of period of lactation owing to the fecundity of Japanese women is not apparent, because of the impossibility of surveying the living conditions concerned.

Cancer of the breast is, in Japan, most frequent in the 40-49 age group and seems to be more frequent on the left side than on the right side. On both sides of the breast, the superior-exterior quadripartite is its location of preference. Macroscopically, nodular form is more frequent than scirrhus form. Histologically, adenomatous type, alveolar type and infiltrative type are of almost equal frequency.

In men, cancer of the breast is exceptional, the features of the incidence of the

disease being, however, similar to those in women.

Further, benignant neoplasms of the breast are represented mostly by fibroadenoma and partly by mastopathia chronica cystica. In the age distribution an apparent displacement is noticed between those benignant neoplasms and cancer of the breast, while in the sex distribution, the site of occurrence and the location of preference, these two types of neoplasms are proved equal to each other.

VI. CANCER OF THE UTERUS

Two hundred forty five autopsy cases and 1,889 biopsy cases of cancer of the uterus collected during the past five and three years respectively, amounting in total to 2,134 cases, were examined en bloc. The number of the autopsy cases corresponds to 1.63 per cent of the grand total number of 15,006 autopsy cases during the past five years and to 5.8 per cent of the number of autopsy cases of malignant neoplasms.

Age. Cancer of the uterus was most frequent in the 40-49 age group. More than 50 per cent of the cases were found in the 40-54 age group (table 22).

Table 22. Age Distribution of Cancer in the Portio Vaginalis, the Canalis Cervicis and the Corpus Uteri.

Age group	Portio vaginalis	Canalis cervicis	Corpus uteri	All sites (%)
20-24	4	0	2	6 (0.3)
25-29	19	3	3	25 (1.3)
30-34	98	15	4	117 (6.1)
35-39	191	22	10	223 (11.7)
40-44	304	44	11	359 (18.8)
45-49	272	43	21	336 (17.6)
50-54	198	66	28	292 (15.3)
55-59	145	43	23	211 (11.0)
60-64	104	32	11	147 (7.7)
65-69	48	14	6	68 (3.5)
70-74	13	5	2	20 (1.0)
75-79	8	1	1	10 (0.5)
80-84	0	1	0	1 (0.1)
Unknown	77	11	9	97 (5.1)
All ages (%)	1481 (77.5)	300 (15.7)	131 (6.8)	1912 (100.0)

Histological types. Taking portio vaginalis, canalis cervicis and corpus uteri all together, canceroid (including squamous cell cancer and its transitive type) was most frequent, representing 62 per cent (1,324 cases) of the cases. Basal cell cancer (including carcinoma simplex) was found in 23.1 per cent (493 cases) and adenomatous cancer (including adenocanceroid) in 10.1 per cent (215 cases) (table 23).

Table 23. Age Distribution of Cancer of the Uterus Classified
According to the Histological Types

Age group	Squam. cell cancer	Basal cell cancer	Adenom. cancer	Histolog. unspecif. cases	Precancer. state	All types (%)
20-24	3	2	3	0	0	8 (0.4)
25-29	13	6	8	0	0	27 (1.3)
30-34	88	24	12	1	1	126 (5.9)
35-39	165	47	24	8	12	256 (12.0)
40-44	244	94	39	11	12	400 (18.7)
45-49	223	107	30	14	5	379 (17.8)
50-54	200	70	39	11	6	326 (15.3)
55-59	146	57	20	7	2	232 (10.9)
60-64	110	35	13	1	3	162 (7.6)
65-69	40	25	8	3	1	77 (3.6)
70-74	16	3	4	2	0	25 (1.2)
75-79	6	4	0	0	0	10 (0.4)
80-84	0	1	0	0	0	1 (0.0)
Unknown	70	18	15	2	0	105 (4.9)
All ages* (%)	1324 (62.0)	493 (23.1)	215 (10.1)	60 (2.8)	42 (2.0)	2134(100.0)

* In this column the figures enclosed in parenthesis indicate the percentages of the respective number of cases to the total number.

Relationships between histological types, location and age.

1. Portio vaginalis: Cancer was most frequent in the portio vaginalis, repre-

Table 24. Age Distribution of Cancer in Portio Vaginalis Classified
According to the Histological Typee.

Age group	Squamous cell cancer	Basal cell cancer	Adenomatous cancer	All types (%)
0-24	1	2	1	4 (0.3)
25-29	11	4	4	19 (1.3)
30-34	72	20	6	98 (6.6)
35-39	144	40	7	191 (12.9)
40-44	214	75	15	304 (20.5)
45-49	185	79	8	272 (18.4)
50-54	143	44	11	198 (13.4)
55-59	108	36	1	145 (9.8)
60-64	79	24	1	104 (7.0)
65-69	31	16	1	48 (3.2)
70-74	10	3	0	13 (0.9)
75-79	4	4	0	8 (0.5)
Unknown	57	14	6	77 (5.2)
All ages* (%)	1059 (71.5)	361 (24.4)	61 (4.1)	1481 (100.0)

* Refer to the subscript of table 23.

senting 69.4 per cent (1,481 cases) of all the cases. As for the age distribution, the disease was most frequent in the 40-49 age group and fifty per cent of the cases were found in the 40-54 age group. Histologically, squamous cell cancer was most frequent, (71.5%), basal cell cancer less frequent (24.4%) and adenomatous cancer least frequent (4.1%) (table 24).

2. Canalis cervicis: Cases detected in the canalis cervicis numbered 300, representing 14 per cent of the total. Here also, fifty per cent of the cases were found in the 40-54 age group. Histologically, squamous cell cancer represented more than half of the cases (59.3%), basal cell cancer was less frequent (26.7%) and adenomatous least frequent (14%). Compared with the number of cases in the portio vaginalis, a decrease in number of cases of squamous cell cancer and a relative increase in number of cases of adenomatous cancer were noticed (table 25).

Table 25. Age Distribution of Cancer in the Canalis Cervicis Classified According to the Histological Types.

Age group	Basal Cell cancer	Squamous cell cancer	Adenomatous cancer	All types (%)
0-29	2	0	1	3 (1.0)
30-34	2	11	2	15 (5.0)
35-39	4	14	4	22 (7.1)
40-44	12	22	10	44 (14.6)
45-49	18	22	3	43 (14.4)
50-54	16	40	10	66 (22.0)
55-59	11	29	3	43 (14.4)
60-64	7	21	4	32 (10.7)
65-69	4	9	1	14 (4.7)
70-74	0	4	1	5 (1.7)
75-79	0	1	0	1 (0.4)
80-84	1	0	0	1 (0.4)
Unknown	3	5	3	11 (3.6)
All ages* (%)	80 (26.7)	178 (59.3)	42 (14.0)	300 (100.0)

* Refer to the subscript of table 23.

3. Corpus uteri: One hundred thirty-one cases were detected in the corpus uteri, corresponding 6.8 per cent of the total and 50 per cent of the cases were found in the 45-59 age group. In the 50 agers, cancer of the uterus was most frequent in the corpus uteri, while in 40 agers it was so in the cervix uteri. Histologically, squamous cell cancer and basal cell cancer were both much less frequent (16% respectively) than adenomatous cancer (68%). Compared with the number of cases in the portio vaginalis, a remarkable decrease in number of cases of squamous cell cancer and reversely a relative increase in number of cases

of adenomatous cancer were noticed (table 26). As a whole, cancer occurred much more frequently in the cervix uteri (93.2%) than in the corpus uteri (6.8%).

Table 26. Age Distribution of Cancer in the Corpus Uteri Classified According to the Histological Types.

Age group	Adenomatous cancer	Squamous cell cancer	Basal cell cancer	All types (%)
0-24	2	0	0	2 (1.5)
25-29	3	0	0	3 (2.3)
30-34	2	1	1	4 (3.1)
35-39	7	2	1	10 (7.6)
40-44	8	2	1	11 (8.4)
45-49	16	3	2	21 (16.0)
50-54	18	6	4	28 (21.3)
55-59	15	2	6	23 (17.5)
60-64	6	2	3	11 (8.4)
65-69	4	0	2	6 (4.6)
70-74	2	0	0	2 (1.5)
75-79	0	1	0	1 (0.8)
Unkown	6	2	1	9 (6.9)
All ages* (%)	89 (68.0)	21 (16.0)	21 (16.0)	131 (100.0)

* Refer to the subscript of table 23.

Table 27. Sites of Cancer of the Uterus Classified According to the Histological Types.

Age group	Squamous cell cancer*	Adenomatous cancer	All types (%)
0-24	5	3	8 (0.4)
25-29	19	8	27 (1.3)
30-34	112	12	124 (6.1)
35-39	212	24	236 (11.7)
40-44	338	39	377 (18.5)
45-49	330	30	360 (17.7)
50-54	270	39	309 (15.3)
55-59	203	20	223 (10.9)
60-64	145	13	158 (7.8)
65-69	65	8	73 (3.6)
70-74	19	4	23 (1.2)
75-79	10	0	10 (0.5)
80-84	1	0	1 (0.0)
Unknown	88	15	103 (5.0)
All ages** (%)	1817 (89.5)	215 (10.5)	2032 (100.0)

* The figures in this column include the number of basal cell cancer cases.

** Refer to the subscript of table 23.

Table 28. Frequency of Cancer Cases in the Cervix Uteri in Relation to the Age and the Frequency of Delivery.

Age group	Frequency of delivery				
	Unmarried 0 (%)	1 - 3 (%)	4 - 7 (%)	8 and upwards (%)	All ages (%)
20-29	1 (20)	2 (40)	2 (40)	0 (0)	5 (100)
30-39	12 (9.1)	52 (39.4)	64 (48.5)	4 (3.0)	132 (100)
40-49	19 (6.9)	83 (30.3)	137 (50.0)	35 (12.8)	274 (100)
50-59	7 (3.5)	45 (22.5)	106 (53.0)	42 (21.07)	200 (100)
60-69	4 (5.4)	16 (21.6)	31 (41.9)	23 (31.1)	74 (100)
70-79	0 (0)	2 (22.2)	5 (55.6)	2 (22.2)	9 (100)
Unknown	2 (13.4)	3 (20.0)	7 (46.6)	3 (20.0)	15 (100)
All ages	45 (6.3)	203 (28.6)	352 (49.7)	109 (15.4)	709 (100)

Histologically, squamous cell cancer considerably exceeded adenomatous cancer (89.5% to 10.5%). By sites, squamous cell cancer was far predominant in number in the cervix, but adenomatous one was almost of equal frequency in both sites (table 24, 25, 26).

Metastasis. Metastasis was found at autopsy in 83.2 per cent as a whole. As for remote organs, the occurrence was 22.8 per cent in the lung, 20.8 per cent in the liver and 7.5 per cent in the kidney. No appreciable difference was noticed in frequency of metastasis according to the histological types of cancer.

For estimating the malignancy of cancer, Prof. Akazaki comparing, in 250 patients, the different histological findings of cancer of the cervix with the length of the individual life span of the patients within 5 years after surgical operation, discerned no special correlation between the malignancy of the disease and the histological findings or the number of mitotic cells. On the contrary, he found that the C.P.L.-classification of cancer proposed by Prof. T. Imai was significant for estimating the prognosis of the disease; in cases with invasion of cancer cells into lymphatic vessels (L-type) as well as in those with diffuse infiltration of cancer cells into the surrounding tissue (P-type), the prognosis was proved to be bad, while it was good in cases with vigorous stromal reaction against cancer cells (C-type).

Clinical diagnosis. Of 245 cases of cancer of the uterus confirmed at autopsy, cases exactly diagnosed as such in clinics were 209, the remaining 36 cases being misdiagnosed. This indicates that, in university hospitals, nearly 1.17 times as many uterine cancer cases existed in reality as were clinically detected.

The reason for the relatively high frequency of cancer of the uterus in Japan could not be obtained from the present study of the autopsy cases of the disease. Moreover, whether or not a certain relationship exists between the incidence of

uterine cancer and menstruation, marriage, pregnancy, births, or customs of Japanese people was not apparent.

As for the relationship between delivery frequency and the incidence of cancer in the cervix, the cases were most frequent in the 40-50 age group having experienced 4-7 deliveries (table 28). However, since a similar delivery frequency was found in the same age group having no experience of cancer, one could not be led to the conclusion that cancer of the uterus is more frequent in women having a high delivery frequency than in those having a low one. Be that as it may, Prof. Yagi insists on the basis of his personal studies for many years, that cancer of the cervix increases in frequency with delivery frequency.

CONCLUSION

Cancer of the uterus is more frequent in Japan than in Europe and the United States. This fact is quite in contrast with the fact that cancer of the breast is less frequent in Japan than in those countries.

Whether or not a certain relationship exists between the incidence of uterine cancer and conditions of marriage, delivery frequency, breast feeding was not established from the present study of the autopsy and biopsy cases concerned. As far as the present materials are concerned, about 50 per cent of uterine cancer cases occur in the 40-54 age group. The rate of cases in the cervix uteri to those in the corpus uteri was as 13: 1 and the rate of frequency of squamous cell cancer to adenomatous cancer was as 9: 1. In the age distribution of cancer of the uterus as a whole, a displacement was noticed between the cervix uteri and the corpus uteri.

VII. CANCER OF THE LUNG

Of 15,006 autopsies performed within the past five years in all the medical colleges and universities in Japan, 351 cases revealed cancer of the lung. This number represents 2.3 per cent of all the autopsy cases and 8.4 per cent of the autopsy cases of malignant neoplasms. These rates appear to be relatively high, as compared with those in the mortality statistics by the Ministry of Public Health. This would probably be due to the special interest in the disease on the part of doctors and the consequent relatively high frequency of autopsies of the disease.

Age. Cancer was most frequent in the 50-54 age group. Fifty per cent of the cases were in the 50-64 age group (table 29).

Sex. There were 273 cases in men and 77 cases in women, the male to female rate being as 3.52: 1. Corrected by the male to female autopsy rate of 5: 3, this rate is reduced to 2.2: 1, still showing a definite superiority in men (table 29).

Table 29. Age and Sex Distribution of Cancer of the Lung.

Age group	Males (%)	Females (%)	Male to female rate	Both sexes (%)
20-24	2 (0.8)	0 (0.0)		2 (0.6)
25-29	6 (2.3)	4 (5.3)		10 (2.9)
30-34	5 (1.9)	4 (5.3)	1.73 : 1	9 (2.7)
35-39	9 (3.4)	8 (10.6)		17 (5.0)
40-44	18 (6.8)	7 (9.3)		25 (7.4)
45-49	36 (13.7)	6 (8.1)	6.84 : 1	42 (12.4)
50-54	53 (20.1)	7 (9.3)		60 (17.7)
55-59	47 (17.8)	12 (16.0)		59 (17.4)
60-64	43 (16.3)	12 (16.0)	3.74 : 1	55 (16.2)
65-69	26 (9.9)	7 (9.3)		33 (9.7)
70-74	15 (5.5)	6 (8.1)		21 (6.2)
75-79	4 (1.5)	2 (2.7)	2.37 : 1	6 (1.8)
All ages	264 (100.0)	75 (100.0)	3.52 : 1	339* (100.0)

* Cases without mention of age and sex are excluded.

It was worthy of notice that, while, before the age of 39, no appreciable difference between the two sexes could be found in the frequency of the disease, after the age of 40 the disease became much more frequent in men than in women, thus showing a male to female rate of 6.84 : 1 in the 45-54 age group. After this age group, the rate decreased again to 3.74 : 1 and 2.37 : 1 respectively in the 55-69 age group and in the 70-79 age group, showing always a definite superiority in men (table 29).

Histological types: Histologically, 1) carcinoma simplex (including round-, oat-, polymorph cell cancer), 2) adenomatous cancer and 3) cancrioid (including squamous cell cancer) were most frequently observed. It is noticed that the frequency of the histological types varies to some extent according to different methods of

Table 30. Sex Distribution of the Histological Types of Cancer of the Lung.

Types	Males (%)	Females (%)	Male to female rate	Both sexes (%)
Adenom. cancer	72 (27.5)	22 (30.0)	3.3 : 1	94 (28.0)
Cancroid	68 (26.0)	6 (8.3)	11.3 : 1	74 (22.0)
Round, Oat cell can.	61 (23.3)	13 (18.0)	4.7 : 1	74 (22.0)
Carc. Polymorph	48 (18.3)	22 (30.6)	2.2 : 1	70 (20.6)
Simp. Cell can.	9 (3.4)	6 (8.3)	1.5 : 1	15 (4.7)
C. simplex	118 (45.0)	41 (56.9)	2.9 : 1	159 (47.3)
All types	4 (1.5)	3 (4.2)	1.3 : 1	7 (2.7)
Others	262 (100.0)	72 (100.0)	3.5 : 1	334 (100.0)
All types				

Table 31. Age Distribution of the Histological Types of Cancer of the Lung.

Age group	20-39 (%)	40-49 (%)	50-59 (%)	60-69 (%)	70 and upwards (%)
Adenom. canc.	14 (38.9)	19 (30.7)	33 (28.2)	18 (22.0)	7 (28.0)
Cancroid	5 (13.8)	14 (22.0)	28 (23.8)	19 (23.2)	5 (20.0)
C. simplex	16 (44.5)	29 (46.0)	54 (46.0)	42 (51.2)	13 (52.0)
Others	1 (2.8)	1 (1.3)	2 (2.2)	3 (3.6)	0 (0.0)
All types	36 (100.0)	63 (100.0)	117 (100.0)	82 (100.0)	25 (100.0)

Table 32. Histological Types of Cancer of the Lung in Relation to its Primary Sites.

Primary sites		Types									all types
		Adenom. cancer			Cancroid			C. simplex			
		M.*	F.**	Both	M.	F.	Both	M.	F.	Both	
Left lung	Superior lobe	13	0	13	16	0	16	24	8	32	61 (19.3)
	Inferior lobe	5	3	8	6	1	7	13	2	15	30 (9.5)
	Uncertain	5	0	5	5	0	5	7	2	9	19 (6.0)
	All lobes (%)	23 (33.8)	3 (13.6)	26 (28.6)	27 (41.1)	1	28 (38.8)	44 (37.9)	12 (30.8)	56 (36.1)	110 (34.8)
Right lung	Superior lobe	12	7	19	17	1	18	31	10	41	78 (24.6)
	Middle lobe	2	1	3	2	0	2	9	2	11	16 (5.1)
	Inferior lobe	15	2	17	5	1	6	15	3	18	41 (12.9)
	Uncertain	5	5	10	1	1	2	5	4	9	21 (6.6)
	All lobes (%)	34 (50.0)	15 (68.2)	49 (54.9)	25 (37.9)	3	28 (38.8)	60 (51.9)	19 (48.7)	79 (51.0)	156 (49.2)
Trachea and bifurca- tion area (%)		2 (2.9)	0	2 (2.2)	5 (7.5)	2	7 (9.7)	4 (3.4)	1 (2.6)	5 (3.2)	14 (4.4)
Uncertain (%)		6 (8.9)	4 (18.2)	10 (11.0)	6 (9.1)	0	6 (8.3)	7 (6.0)	6 (15.3)	13 (8.4)	29 (9.1)
Others (%)		3 (4.4)	0	3 (3.3)	3 (4.4)	0	3 (4.2)	1 (0.8)	1 (2.6)	2 (1.3)	8 (2.5)
All sites (%)		68 (100.0)	22 (100.0)	90 (100.0)	66 (100.0)	6	72 (100.0)	116 (100.0)	39 (100.0)	155 (100.0)	317 (100.0)

* Males

** Females

classification. As far as the present materials are concerned, the frequency was high in the following order: 1), 2) and 3). The men to women rate was as 3.3: 1 in adenomatous cancer and as 2.9: 1 in carcinoma simplex, while in cancroid, the rate was as high as 11.3: 1, that is to say, in all the types, men definitely

exceeded women, especially in the rate of cancrroid in the cancer ages (table 30). Further, with age, adenomatous cancer decreased, while carcinoma simplex and cancrroid increased in rate of frequency (table 31).

Primary sites. Lung cancers were located, on both sides, mostly in the superior lobe of the lung; the primary sites were, in both sexes, more frequent in the right lung (49.2%) than in the left (34.8%), and less frequent in the other lobes and in the bifurcate portion of the bronchus. This is probably due to the difference in volume of the respective lungs (table 32).

Relationship between sites and the histological types. All the histological types were found regardless of sites. In frequency of occurrence, carcinoma simplex and adenomatous cancer were found to be more frequent in the right lung, and cancrroid and c. simplex were more frequent in the superior lobe on both sides. It was worth noticing that, while, in men, cancrroid was found frequently in the superior lobe of the lung on both sides, this was scarcely the case in women (table 32).

Macroscopical forms. When divided into nodular, miliary and infiltrative forms, cancer of the first form represented 64.5 per cent of all the cases, that of the second and of the third being 4.8 and 29.4 per cent respectively (table 33).

Relationships between the primary sites and the macroscopical forms or the histological types. No particular relationship was discernible (tables 33, 34).

Table 33. Macroscopical Forms of Cancer of the Lung in Relation to its Primary Site.

Sites	Nodular form (%)	Miliary form (%)	Infiltrative and diffuse f. (%)	Endothelioma (%)	All forms (%)
Left lung	72 (65.4)	4 (3.6)	33 (30.1)	1 (0.9)	110(100.0)
Right lung	105 (66.4)	1 (0.6)	50 (31.7)	2 (1.3)	158(100.0)
Trachea and bifurcation area	10 (76.9)	0 (0.0)	3 (23.1)	0 (0.0)	13(100.0)
Uncertain	12 (44.5)	8 (29.6)	6 (22.2)	1 (3.7)	27(100.0)
Others	5 (62.5)	2 (25.0)	1 (12.5)	0 (0.0)	8(100.0)
All sites	204 (64.5)	15 (4.8)	93 (29.4)	4 (1.3)	316(100.0)

Table 34. Relationship between the Histological Types and the Macroscopical Forms of Cancer of the Lung.

Types	Nodular form (%)	Miliary form (%)	Infiltrative and diffuse f. (%)	Endo-thelioma (%)	All forms (%)
Adenom. cancer	58 (66.6)	8 (9.2)	20 (23.0)	1 (1.2)	87(100.0)
Cancroid	38 (61.2)	2 (3.3)	22 (35.5)	0 (0.0)	62(100.0)
C. simplex	95 (63.3)	5 (3.3)	48 (32.1)	2 (1.3)	150(100.0)
Others	5 (71.4)	0 (0.0)	1 (14.3)	1 (14.3)	7(100.0)

Table 35. Frequency of Metastasis of Cancer of the Lung Classified According to Sex

Sex	Metastasis	No metastasis	Rate of metastasis
Males	266	3	98.8%
Females	69	4	94.5%
Both sexes	366	7	97.9%

Table 36. Frequency of Metastasis of Cancer of the Lung Classified According to the Histological Types

Types	Metastasis	No metastasis	Rate of metastasis
Adenom. cancer	90	3	96.7%
Cancroid	71	1	98.6%
C. simplex	154	2	98.7%

Table 37. Grade of Exactness of the Clinical Diagnosis of Cancer of the Lung Observed According to Sex.

Diagnosis		Males	Females	Both sexes
Cases exactly diagnosed or suspected as	Lung cancer	121	21	143*
	Neoplasm of the lung	26	6	32
	Both cases (%)	147 (55.4)	27 (36.0)	175* (51.2)
Cases misdiagnosed in which	Neoplasms	78	30	108
	Not tumors	40	18	58
	Both cases (%)	118 (44.6)	48 (64.0)	116 (48.8)
All cases (%)		265 (100.0)	75 (100.0)	341* (100.0)

* These figures contain one case of which mention was not made as to sex.

Differences in the macroscopical forms according to sex. No particular difference was noticed.

Metastasis. Metastasis was detected in 98 per cent of the cases, but no difference in the frequency of the macroscopical forms and the histological types was noticed between the two sexes (tables 35, 36). As for organs, not only different lymph nodes, but also the liver, the lung, the suprarenal gland, the kidney, the brain and the bones were sites of metastasis. In general, the metastasis of cancroid was found to be more limited than that of adenomatous cancer and carcinoma simplex.

Evolution of the disease. The average life span from the revelation of the

disease to death was about 10 months, deaths within one year being 75.5 per cent and those within two years 95.1 per cent.

Clinical diagnosis. Of 341 lung cancer cases confirmed as such at autopsy, the total number of cases exactly diagnosed or suspected as such in clinics was only 175 (cases exactly diagnosed as cancer of the lung: 132, suspected as such: 11, neoplasms of the lung: 32), representing about 51 per cent of all the cases. Cases diagnosed as unspecified neoplasm were 108 and cases diagnosed as non-neoplastic were 58. Among the cases exactly diagnosed in clinic as cancer of the lung, no case was reported which was not confirmed as such at autopsy (table 37).

The fact just mentioned indicates that even in university hospitals, lung cancer cases existed in reality nearly twice as often as those clinically diagnosed. In hospitals other than university hospitals as well as in the figures in the mortality from cancer obtained from the number of general postmortem certificates, the actual number of lung cancer cases clinically diagnosed as such seems to be far small of the real incidence of the disease.

Table 38. Taste for Cigarettes in Relation to Cancer of the Lung Observed According to Sex.

Sex	Those having a liking (%)	Those not having a liking (%)	total
Males	135 (91.8)	12 (8.2)	147 (100.0)
Females	9 (21.9)	32 (78.1)	41 (100.0)
Both sexes	144 (76.6)	44 (23.4)	188 (100.0)

Table 39. Number of Cigarettes Used per diem in Relation to the Histological Types of Cancer of the Lung.

Sex	Number of cigarettes (in pieces)							All cases
	-5	-10	-20	-30	-40	-50	-60	
Males	7	47	35	7	3	3	1	103
Females	0	1	2	0	0	0	0	3
Both sexes	7	48	37	7	3	3	1	106
Adenom. cancer (%)	4 (57.0)	13 (27.0)	10 (27.8)		1 (7.1)			28
Cancroid (%)	1 (14.5)	13 (27.0)	10 (27.8)		7 (50.0)			31
Carcinoma simplex (%)	2 (28.5)	21 (43.7)	16 (44.4)		6 (42.9)			45
Others		1 (2.3)						1
All types (%)	7 (100.0)	48 (100.0)	36 (100.0)		14 (100.0)			

Table 40. Histological Types of the Lung Cancer in Both Sexes not Having a Liking for Cigarettes.

Types	Males	Females	Both sexes
Adenom. cancer (%)	2 (5.3)	10 (26.3)	12 (31.6)
Cancroid (%)	5 (13.1)	3 (8.0)	8 (21.1)
C. simplex (%)	3 (8.0)	14 (36.7)	17 (44.7)
Others (%)	0 (0.0)	1 (2.6)	1 (2.6)
All types (%)	10 (26.4)	28 (73.6)	38 (100.0)

Causes of the disease. Very few statistical studies are found in Japan, concerning the causes of the disease. Autopsy cases of the disease were much more frequent in urban districts (70%) than in rural districts (30%). This is, however, due principally to the differences in frequency of autopsy cases between the two districts. No particular difference was found according to occupations. As for combined diseases, tuberculosis was found in 6.3% (22 cases); no silicosis case was encountered.

Tastes. Those having a liking for cigarettes were found in 77% of the cases, the rest representing those not having a liking for them (table 38). The amount of cigarettes used per capita was relatively small, except for cancroid which was found to occur relatively often in those who used relatively a great number of cigarettes (30-60 cigarettes per diem) (table 39). However, as a whole, no appreciable difference was found between the cigarette-loving group and the non-cigarette-loving group (table 40).

CONCLUSION

Within recent years, the number of cases of cancer of the lung is tending to increase all over the world. In Japan, the rate of occurrence of the disease has been considered to be relatively low, as compared with that in Europe and United-States. However, considering the low reliability of the diagnosis of the disease even in university hospitals as well as the relatively low rate of the advanced age group to the population as a whole in Japan, the rate of occurrence of the cancer of the lung in this country could not be considered to be definitely lower than that in the foregoing countries. The actual male to female rate of frequency of the disease obtained from the present materials was found to be 3.52: 1, but, in the actual number of cases, the difference in rate would be considerably reduced.

The considerable difference in the frequency of lung cancer between men and

women would be ascribed to the fact that, after the age of 40, the disease is more frequent in men than in women and that, histologically, cancrroid occurs less frequently in women than in men in the superior lobes of both lungs.

Generally, cancer of the lung occurs more frequently in the right lung than in the left, locating preferably in the superior lobe of the lung.

Though not fully satisfactory, the present investigations on the causes of the disease show that no particular difference exists between urban and rural districts, occupations and combined diseases. It is interesting that cancrroid seemed to be more frequent in men having a great liking for cigarettes than those who do not like them. However, in the present phase of the study, nothing conclusive can be drawn from the data available.

VIII. PRIMARY CANCER OF THE LIVER

Of 4,182 malignant neoplasm cases detected in 15,006 reported autopsy cases as a whole executed during the past five years in all the medical colleges and universities in Japan, 356 cases of primary cancer of the liver including biliary cancer were found. This number corresponds to 2.5 per cent of all the autopsy cases and to 8.55 per cent of the autopsy cases of malignant neoplasms. According to the site of occurrence, these primary cancer cases are divided into two groups as follows:

Table 41. Age and Sex Distribution of Liver Cell Cancer

Age group	Males (%)	Females (%)	Both sexes (%)
0- 4	6 (3.9)	3 (7.5)	9 (4.6)
5- 9	0 (0.0)	0 (0.0)	0 (0.0)
10-14	1 (0.7)	0 (0.0)	1 (0.5)
15-19	1 (0.7)	0 (0.0)	1 (0.5)
20-24	2 (1.3)	0 (0.0)	2 (1.0)
25-29	2 (1.3)	0 (0.0)	2 (1.0)
30-34	5 (3.3)	2 (5.0)	7 (3.6)
35-39	15 (9.8)	2 (5.0)	17 (8.7)
40-44	20 (13.1)	3 (7.5)	23 (11.8)
45-49	19 (12.4)	7 (17.5)	26 (13.4)
50-54	27 (17.6)	9 (22.5)	36 (18.5)
55-59	24 (15.7)	4 (10.0)	28 (14.6)
60-64	22 (14.4)	6 (15.0)	28 (14.6)
65-69	5 (3.3)	2 (5.0)	7 (3.6)
70-74	1 (0.6)	3 (7.5)	4 (2.0)
Unknown	3 (1.9)	0 (0.0)	3 (1.6)
All ages	154 (100.0)	40 (100.0)	194 (100.0)

a. Primary cancer of the liver cell: 154 cases for males, 40 for females, totaling 194 cases.

b. Primary cancer of the bile duct and gall bladder: 95 cases for males, 67 for females, totaling 162 cases.

a. Primary cancer of the liver cell (Hepatoma).

Age and Sex. About half of the cases were found in the 50-64 age group. Even in the 0-4 age group, 9 cases were found (table 41). In the age and sex distribution, men exceeded women in all ages, the men to women rate being as 4 : 1. Corrected by the men to women autopsy rate of 5 : 3, this rate was reduced to 2.3 : 1.

The primary sites were found in 49.6 per cent (82 cases) in the right lobe, in 14.5 per cent (24 cases) in the left and in 35.9 per cent in both lobes (table 42). The right lobe to left lobe rate of the primary sites was 3.7 : 1. This rate, however, corresponds to the volume rate of the right lobe to the left.

In the primary sites, multicentric occurrence was much more frequent than unicentric, the rates being 70.8 per cent (125 cases) for the former and 29.2 per cent (52 cases) for the latter (table 43).

Macroscopical forms. For nodular form, 83.5 per cent (162 cases), 9.3 per cent (18 cases) for diffuse form and 7.2 per cent (14 cases) for others were found.

Histological types. Adenomatous cancer forming rosettes was found in 54.1 per cent (85 cases) of the cases, carcinoma simplex in 28.6 per cent (45 cases),

Table 42. Primary Sites of Liver Cancer

Age Group	Right lobe	Left lobe	Both lobes	All lobes
0- 4	5	2	0	7
5- 9	0	0	0	0
10-14	1	0	0	1
15-19	0	0	1	1
20-24	0	0	1	1
25-29	1	0	0	1
30-34	3	0	1	4
35-39	7	1	9	17
40-44	6	4	7	17
45-49	12	3	8	23
50-54	14	7	11	32
55-59	13	4	10	27
60-64	13	2	7	22
65-69	3	1	1	5
70-74	3	0	1	4
Unknown	1	0	2	3
All ages (%)	82 (49.6)	24 (14.5)	59 (35.9)	165 (100.0)

Table 43. Modality of Occurrence of Liver Cell Cancer.

Age group	Unicentric.	Multicentric.	All modes
0- 4	4	5	9
5- 9	0	0	0
10-14	1	0	1
15-19	0	1	1
20-24	0	2	2
25-29	0	2	2
30-34	1	6	7
35-39	4	13	17
40-44	5	14	19
45-49	8	15	23
50-54	6	25	31
55-59	10	18	28
60-64	9	15	24
65-69	3	3	6
70-74	0	3	3
Unknown	1	3	4
All ages (%)	52 (29.2)	125 (70.8)	177 (100.0)

Table 44. Histological Types of Liver Cell Cancer.

Age group	Adenom. cancer	Carc. simplex	Mixed type	Others	All tyoes
0- 9	3	2	4	0	9
10-19	0	2	0	0	2
20-29	1	1	0	0	2
30-39	12	6	1	0	19
40-49	18	6	2	2	28
50-59	32	17	10	1	60
60-69	16	9	6	0.	31
70-79	2	0	1	0	3
unkown	1	2	0	0	3
All ages (%)	85 (54.1)	45 (28.6)	24 (15.3)	3 (1.9)	157 (100.0)

Table 45. Age and Sex Distribution of Biliary Cancer

Age group	Males	Females	Both sexes
20-24	0	1	1
25-29	2	1	3
30-34	0	1	1
35-39	4	2	6
40-44	7	5	12
45-49	13	8	21
50-54	12	7	19
55-59	10	10	20
60-64	24	13	37
65-69	11	6	17
70-74	5	4	8
75-79	4	3	7
80-84	0	1	1
85-89	0	0	0
90-94	0	1	1
Unknown	3	4	7
All ages (%)	95 (58.6)	67 (41.4)	162 (100.0)

Table 46. Primary Sites of Biliary Cancer

Age group	Intrahepatic bile ducts	Hepatic ducts	Cystic duct	Chole- dochus	Gall bladder	All sites
20-29	0	1	0	2	1	4
30-39	2	0	1	1	1	5
40-49	6	3	1	1	12	23
50-59	6	0	3	6	17	32
60-69	5	3	8	13	19	48
70-79	3	1	0	5	6	15
80-89	0	0	0	1	0	1
90-99	0	0	0	0	1	1
Unknown	2	1	0	0	3	6
All ages (%)	24 (17.9)	9 (6.7)	13 (9.7)	29 (21.6)	60 (44.1)	135 (100.0)

combined forms of the two types or combined forms with biliary cancer in 15.3 per cent (24 cases) (table 44).

Infiltration and Metastasis. Being found hundred per cent in the liver, infiltration was noticed as well in the portal vein as in the gall bladder. Metastasis was found in 40.7 per cent (79 cases) and in 24.2 per cent in the portal fissure.

Complications. Liver cirrhosis was most frequent, representing 76.3 per cent (134 cases) of 176 cases of which note was taken of the existence or none existence of complications. The majority of the liver cirrhosis cases were of Laennec type (121 cases, 91 %). Cholelithiasis was found only in 5.2 % (10 cases).

Clinical diagnosis. Of 189 liver cancer cases confirmed at autopsy, those exactly diagnosed as such in clinics were 122 (64.7%). Now, the sum of cases exactly diagnosed as such in clinics and those misdiagnosed as such amounted to 301. If this number is compared with the number of cases confirmed at autopsy, the rate will be 1 : 0.63. This indicates that, even in university hospitals, the number of liver cancer patients was not as great as was estimated in the clinics.

Concerning the living history and the alimentation of liver cancer patients which would be very helpful for clarifying the reason for the high frequency of liver cancer in Japan, no apparent data could be obtained from the present materials.

b. Biliary cancer (cancer of the bile duct and the gall bladder).

Of 4,182 autopsy cases, cancer of the bile duct, intra- and extra-hepatic, together with gall bladder cancer was detected in 162 cases. This number represents 45% of 356 cancer cases of the liver as a whole. The rate of the biliary cancer cases as a whole to the liver cell cancer cases was 1.2 : 1. If limited to the bile duct inside the liver, the rate will become much greater.

Age and Sex. Different from liver cell cancer, cancer of the bile duct as well as that of the gall bladder were not found before the age of 20. They were most frequent in the 60-64 age group and 60 per cent of the cases were found in the 45-64 age group (table 45).

The male to female rate of the diseases was 1.4 : 1, but, corrected by the male

Table 47. Macroscopical Forms of Biliary Cancer

Nodular form	Infiltrative form	Papillary form	Others	All forms
63 (50.8)	52 (41.9)	7 (5.7)	2 (1.6)	124 (100.0)

to female autopsy rate of 5 : 3, the rate was almost the same in the two sexes (table 45).

Site. In the bladder, 44.1 per cent (60 cases) of the cases were found, 21.6 per

Table 48. Histological Types of Biliary Cancer

Age group	Adenom. cancer	Carcinoma simplex	Squamous cell cancer	Others	All types
20-29	3	0	1	0	4
30-39	6	0	0	0	6
40-49	30	2	1	0	33
50-59	29	4	1	4	38
60-69	40	2	2	3	47
70-79	13	2	1	0	16
80-89	1	0	0	0	1
90-99	1	0	0	0	1
Unknown	6	0	0	1	7
All ages (%)	129 (84.4)	10 (6.5)	5 (3.9)	8 (5.2)	153 (100.0)

cent (29 cases) in the choledochus, 17.9 per cent (24 cases) in the intrahepatic bile ducts, Cancer was also found in the cystic duct (13 cases, 9.7 %) and in the hepatic duct (9 cases, 6.7 %) (table 46).

Macroscopical forms. Generally, nodular and infiltrative forms were almost of equal frequency. Papillary form was less frequent (table 47).

Histological types. The majority of the cases were of adenomatous cancer (84.4 %). Squamous cell cancer was less frequent (table 48).

Metastasis. Besides lymph nodes, metasis was noticed in the lung and the liver.

Complication. Liver cirrhosis was found to be relatively frequent (33 cases, 27.6 %). Different from liver cell cancer, Laennec type of liver cirrhosis was found in only 12 per cent of the cases. The rest of the cases were of biliary cirrhosis.

Biliary cancer accompanying liver cirrhosis was frequent in the choledochus. Of 33 cholelithiasis cases combined with biliary cancer, 22 cases were found in cancer of the gall bladder.

Clinical diagnosis. The clinical diagnosis of biliary cancer is extremely difficult. Of the cases confirmed as such at autopsy, only 14.2 % had been exactly diagnosed as such in clinics. Even if liver cell cancer cases clinically diagnosed as biliary cancer are taken into account, the rate does not surpass 50 per cent.

Data concerning the life history or the alimentation of the patients could not be obtained.

CONCLUSION

Three hundred fifty six cases of primary cancer of the liver as a whole detected in the present materials represent 2.36 per cent of all the autopsy cases of 15,006. This rate is about 18 times that in Europe and United States (0.13 per

cent according to Eggel). This fact is well in accord with the fact that primary cancer of the liver is generally much more frequent in Japan than in those countries.

However, the real number of liver cancer cases is considered to be much less than is estimated from the mortality figures based on post-mortem certificates. On the contrary, the real number of biliary cancer cases is assumed to be about 3 times the actual number obtained from the mortality reports.

The rate of the number of primary liver cell cancer cases to that of biliary cancer cases is at 1.2 : 1 in Japan.

The men to women rate is at 4 : 1 for liver cell cancer and 1.4 : 1 for biliary cancer, but, if corrected by the men to women autopsy rate of 5 : 3, the rate becomes almost equal for biliary cancer with a still definite superiority in men as to the rate for liver cell cancer.

The reason for the particular statistical feature of cancer of the liver in Japan is not apparent. In this connection, it may be mentioned at least that liver cell cancer has a close relation to liver cirrhosis of Laennec type. However, biliary cancer has no particular relation to the latter. Moreover, malaria, syphilis and parasites can not be considered to have any relation to cancer of the liver as a whole, at least in Japan.

IX. CANCER OF THE STOMACH

In the total 15,006 autopsies executed during the past five years in Japan, 960 cases of cancer of the stomach were detected. In addition to this, 1,230 biopsy cases of the same disease, amounting all together to 2,190 cases were statistically examined.

Sex. Of 2,086 stomach cancer cases with exact mention of sex, 1,409 cases (67.0 %) were found in men and 677 cases (33.0 %) in women. If corrected by the male to female autopsy rate of 5 : 3 as already mentioned in a previous chapter, the male to female rate in this case is 1.25 : 1. This rate is almost equivalent to that in the mortality concerned (table 49).

Age. Cancer of the stomach was most frequent in the 50-54 age group and 50 per cent of the cases were found in the 45-59 age group. As for the relationship between age and sex, the men to women rate was 1.12 : 1 in the 20-39 age group. If corrected by the male to female autopsy rate of 5 : 3, the rate become greater in women than that in men (table 49). In the mortality records, death cases from stomach cancer were almost equal in the two sexes or apparently a little more frequent in women than in men before the age of 40. After the age of 40, stomach cancer cases increased promptly in both sexes, especially in men, with

Table 49. Age and Sex Distribution of Cancer of the Stomach.

Age group	Males (%)	Females (%)	Both sexes (%)
15-19	8 (0.5)	0 (0.0)	8 (0.4)
20-24	20 (1.4)	13 (1.9)	33 (1.6)
25-29	32 (2.2)	25 (3.7)	57 (2.7)
30-34	53 (3.7)	44 (6.5)	97 (4.6)
35-39	88 (6.2)	90 (13.3)	178 (8.6)
40-44	146 (10.3)	80 (11.8)	226 (10.8)
45-49	197 (13.8)	87 (12.7)	284 (13.6)
50-54	281 (19.9)	119 (17.6)	400 (19.3)
55-59	241 (17.2)	91 (13.8)	332 (15.9)
60-64	168 (11.9)	72 (10.6)	240 (11.5)
65-69	122 (8.6)	37 (5.4)	159 (7.6)
70-74	35 (2.4)	9 (1.3)	44 (2.1)
75-79	13 (0.9)	5 (0.7)	18 (0.3)
80-84	1 (0.7)	5 (0.7)	6 (0.3)
85-89	4 (0.3)	0 (0.0)	4 (0.1)
All ages	1409 (100.0)	677 (100.0)	2086 (100.0)

a male to female rate of 2.33 : 1 until the age of 79. This rate is corrected in the same manner to 1.43 : 1, still showing in men a definite superiority in number. A similar relationship was found between the two sexes in the mortality records of the same age group (table 49).

Relationship of the histological types to age and sex. Histologically, adenomatous cancer represented 55.7 per cent of all the cases, carcinoma simplex 37.0 per cent. The other types were not frequent.

Before the age of 44, no appreciable difference was noticed in the frequency of adenomatous cancer and that of carcinoma simplex. After the age of 45, the former had a tendency to exceed the latter in frequency and in the 55-69 age group, the former was found two times more frequently than the latter. In the far-advanced age group, this difference decreased again (table 50).

In the frequency of carcinoma simplex, no appreciable difference was noticed according to sex in each age group. However, if corrected by the men to women autopsy rate of 5 : 3, the rate of frequency of this type is estimated to be rather more high in women than in men. On the contrary, being almost equal in both sexes before the age of 39, the rate of frequency of adenomatous cancer was such as 3.05 : 1 in the 40-69 age group. After being corrected by the male to female autopsy rate of 5 : 3, the rate was 2 : 1, showing in men always a definite superiority in number of cases (table 50). After the age of 74, this difference between the sexes diminished again.

Judging from the fact just mentioned, the particularly high frequency of adeno-

Table 50. Histological Types of Cancer of the Stomach Classified According to Age and Sex (1885 Cases).

Age group	Adenom. cancer (Cylindrical cell cancer)			Carcinoma simplex (Gland cell cancer)			Cancroid			Adeno-cancroid			Others			All types
	M.*	F.**	B.***	M.	F.	B.	M.	F.	B.	M.	F.	B.	M.	F.	B.	
15-19	4	0	4	2	0	2	0	0	0	0	0	0	1	0	1	7
20-24	9	4	13	10	7	17	0	0	0	0	0	0	0	0	0	30
25-29	15	6	21	13	12	25	0	0	0	0	0	0	2	4	6	52
30-34	22	14	36	23	25	48	0	0	0	1	0	1	1	4	5	90
35-39	36	24	60	36	48	84	0	0	0	0	0	0	3	8	11	155
40-44	72	24	96	57	37	94	0	0	0	2	1	3	5	7	12	205
45-49	114	37	151	50	30	80	2	1	3	0	0	0	8	9	17	251
50-54	159	53	212	89	40	129	2	2	4	2	2	4	13	7	20	369
55-59	141	51	192	66	26	92	1	0	1	0	0	0	8	8	16	301
60-64	97	34	131	36	25	61	1	0	1	1	0	1	10	6	16	210
65-69	76	17	93	28	15	43	1	1	2	2	0	2	5	1	6	146
70-74	21	4	25	9	5	14	1	0	1	0	0	0	2	1	3	43
75-79	6	3	9	6	1	7	0	0	0	0	0	0	1	0	1	17
80-84	1	4	5	0	1	1	0	0	0	0	0	0	0	0	0	6
85-89	2	0	2	1	0	1	0	0	0	0	0	0	0	0	0	3
All ages	775	275	1050	426	272	698	8	4	12	8	3	11	59	55	114	1885
(%)	(55.7)			(37.0)			(0.6)			(0.6)			(6.1)			(100.0)

* Males

** Females

*** Both sexes

matous cancer in the 40-69 age group of men would be the reason for the difference of frequency in the two sexes of stomach cancer as whole. To the exclusion of this particular elevation of the rate in men, the rate of frequency of stomach cancer as a whole is almost the same in both sexes.

Location. Of 1,736 stomach cancer cases, 66.7 per cent were found in the pylorus, 13.9 per cent in the lesser curvature, 10.4 per cent in the cardia, representing all together 91 per cent of the total number of cases. In the greater curvature together with the corpus, only 9 per cent were found (table 51).

No special correlation was noticed between the histological types and the sites, except for cancroid and adenocancroid for which the pylorus was found to be the site of preference (table 52).

No appreciable difference between the sexes in frequency of cancer was found, according to the sites, except for the pylorus, in which, almost equally frequent in both sex before the age of 44, stomach cancer was more frequent in men than in women in the 45-69 age group, the men to women rate thereof being 2.6: 1. Corrected by the men to women autopsy rate of 5: 3, this rate becomes 1.61: 1,

Table 51. Location of Cancer of the Stomach (1736 Cases).

Location		Number of cases (%)	
Lesser curvature	Cardia	178	(10.4)
	Corpus	242	(13.9)
	Pylorus	1157	(66.7)
Greater curvature	Corpus	130	(7.4)
	Fundus	29	(1.6)
In total		1736	(100.0)

Table 52. Location of Cancer of the Stomach According to the Histological Types (1604 Cases).

Location		Adenom. cancer (%)	Carc. simplex (%)	Cancroid (%)	Adeno-cancroid (%)	Others (%)
Less. curv.	Cardia	93 (10.2)	62 (10.7)	4 (44.5)	3 (33.4)	4 (4.5)
	Corpus	115 (12.6)	91 (15.8)	0	1 (11.1)	9 (9.9)
	Pylorus	633 (69.3)	374 (64.0)	2 (22.1)	2 (22.2)	70 (76.9)
Great. curv.	Corpus	59 (6.4)	43 (7.5)	3 (33.4)	3 (33.3)	6 (6.5)
	Fundus	14 (1.5)	11 (2.0)	0	0	2 (2.2)
In total		914(100.0)	581(100.0)	9(100.0)	9(100.0)	91(100.0)

Table 53. Macroscopical Forms of Cancer of the Stomach in Relation to the Histological Types (1186 Cases).

Types	Polyp. papill. form	Ulcer. soft form	Scirrhus form	Mucous form	All forms
Adenomat. cancer	135	249	110	98	592
Carcinoma simplex	55	161	208	45	469
Cancroid	1	4	2	0	7
Adenocancroid	2	3	2	0	7
Others	18	29	28	36	111
All types (%)	211 (17.5)	446 (37.7)	350 (29.7)	179 (15.1)	1186(100.0)

showing in men always a definite superiority in number of cases. This fact indicates that adenomatous cancer which is extremely frequent in 40-69 age group of men occurs preferably in the pylorus of the stomach (tables 49, 50, 51 and 52).

Macroscopic forms. Ulcerous soft cancer was most frequent, representing 37.7 per cent of 1,186 stomach cancer cases which exactly reported the macroscopic forms. Scirrhus form was found in 29.7 per cent and polypous papillary form

in 17.5 per cent. Mucous form was least frequent, representing 15.1 per cent of the cases.

Histologically, adenomatous cancer was predominant in ulcerous soft form and polypous form, while, in scirrhus form, carcinoma simplex was predominant. In mucous form, adenomatous type was predominant (table 53).

Infiltration and metastasis. Infiltration was observed mostly in the neighbouring organs such as the greater omentum, the mesenterium, the liver and the head of the pancreas. Metastasis was noticed not only in the lymph nodes located in the region of the stomach, the mesenterium and the posterior peritoneum, but also frequently in the liver, the lung, the pancreas and the suprarenal gland. Frequency of metastasis was found to be almost equal in all the histological types.

Anamnesis. Of 456 stomach cancer cases with exact mention as to anamnesis, pylorus ulcer was found in 27.2 per cent (124 cases), chronic gastritis in 30.7 per cent (140 cases), hypochlorhydria in 6.4 per cent (29 cases) and anemia in 10.5 per cent (48 cases).

Table 54. (According to Kuru).

Number of stomach cancer cases	Cases having suffered from				Without exact history
	Ulcer	Chron. Gastritis	Gastric polyp	Germ-immigration*	
315	123	119	53	6	14
(%)	(39.1)	(37.8)	(16.8)	(1.9)	(4.4)

* "Keimverirrung" according to Cohnheim.

In this regard, on the basis of his comparative histological studies of the different types and forms of the disease, Kuru claimed the data shown in table 54 as showing a close relation of stomach ulcer, chronic gastritis and gastric polyp to the development of stomach cancer in Japan.

Evolution of the disease. Of the autopsy and biopsy cases of stomach cancer, deaths within one year after the revelation of the disease were 75.0 per cent, those within 3 years 98.0 per cent (disregarding radical cure cases).

According to the different histological findings of stomach cancer, Imai divided the latter into the following 3 types: C-type (cirrhotic type), in which an intense stromal reaction is noticed surrounding the proliferating cancer cells. P-type (progressive type), in which the infiltrative proliferation of cancer cells is noticed among the fibres of the surrounding connective tissue (Schub) and L-type (lymphogenous spreading type), in which the continuous proliferation of cancer cells is noticed in the lymphatic vessel. According to those 3 types, Imai traced the life span of stomach cancer patients after surgical operation and noticed that, while, in C-type, the majority of the patients survived more than 3 years after

operation, in P- and L-types, only 40 per cent of the patients did so. Especially, in far-advanced P- and L-types, none of the patients survived beyond 3 years. He thus insisted on the important role of the C-, P- and L-types of stomach cancer in the prognosis of the disease.

Clinical diagnosis. Of 960 stomach cancer confirmed at autopsy, cases exactly diagnosed as such in clinics were 658 (68.6 %). Now, of all the autopsy cases in general, those clinically diagnosed as stomach cancer amounted to 738 cases including, of course, some cases misdiagnosed as stomach cancer. If this number is compared with the number of cases confirmed at autopsy, the rate will be at 1: 1.3. This fact indicates that, in university hospitals, stomach cancer patients were present in reality 1.3 times those clinically diagnosed, at least from the standpoint of pathological autopsy.

CONCLUSION

Of all kinds of cancer, cancer of the stomach is of considerably frequent occurrence in Japan. If corrected according to the age distribution of population, the death rate from cancer of the stomach is apparently higher in Japan than in Europe and the United States.

It is worthy of notice that, while the death rate from cancer as a whole is lower, the death rate from uterus cancer, liver cancer and stomach cancer is particularly higher in Japan than in the European countries including the United States.

The men to women rate in 2,190 stomach cancer cases examined in the present study is actually 2.12: 1. However, if corrected by the men to women autopsy rate of 5: 3, this rate is reduced to 1.32: 1. This corrected rate is almost equivalent to that in the mortality reports concerned.

Almost 50 per cent of stomach cancer cases were found in the 45-59 age group. Before the age of 39, no appreciable difference in the frequency of the disease is noticed between the two sexes. After the age of 40 up to 79, the disease is apparently more frequent in men than in women.

Histologically, adenomatous cancer is most frequent, carcinoma simplex is the next in frequency and the other types are least frequent. Carcinoma simplex occurs equally in both sexes in each age group, but adenomatous cancer is particularly frequent in the 40-70 age group of men. In both sexes, cancer of the stomach as a whole occurs preferably in the pylorus and the lesser curvature in 90 per cent of the cases. To sum up, the sexual difference in frequency of stomach cancer is considered to be due to the particularly high frequency of adenomatous cancer in the pylorus and the lesser curvature of men of cancer age.

As for the macroscopical forms, ulcerous soft form is most frequent, scirrhous form is the next frequent and papillary form is least frequent.

The frequency of metastasis has no relationship to the macroscopical forms nor to the histological types of cancer.

Gastric ulcer, chronic gastritis and hypochlorhydria in anamnesis seem to have some relation to the development of cancer of the stomach.

In university hospitals, at most about 68.6 per cent of the real number of stomach cancer are assumed to be exactly diagnosable in clinic. This percentage is considered to be more or less reduced in general hospitals other than university hospitals.

Among the questionnaires required by the Society of Geographical Pathology, data concerning the life history of stomach cancer patients could not be obtained, but recently stomach cancer cases are considered to occur relatively more frequently in rural districts in this country, since the annual mortality from stomach cancer is tending to increase in those districts.

X. GENERAL CONSIDERATIONS

In order to assess the real incidence of cancer in Japan, it is necessary to know first the real number of cancer cases. For this purpose, the mortality from cancer figured on the basis of post-mortem certificates must be revised in view of the data obtained from autopsy cases in general, taking into account, at the same time, the cases of the disease which were radically cured. Then, for geographical pathological comparison, the data thus obtained must be reviewed according to the age and sex distribution of the populations by countries or by districts.

For the reason just mentioned, what comes first into question is the reliability of the clinical diagnosis of the disease. This may be evaluated as follows:

Let N represent the number of autopsy cases as a whole, n the number of cases diagnosed as cancer in clinics and p the number of cases in n confirmed as cancer at autopsy, then the coincidence rate will be $\frac{p}{n} \pm m1 \times 100$ in percentage ($m1$: possible error of percentage). On the other hand, if, of $N-n$ cases which are not clinically diagnosed as cancer, q cases are confirmed as such at autopsy, the detection rate at autopsy will be $\frac{q}{N-n} \pm m2 \times 100$ in percentage.

Since the real number of cancer cases s is represented by $p+q$, the rate of the number of cases clinically diagnosed to the real number of cases will be $\frac{p+q}{n}$. Then, the reliability of the clinical diagnosis will be expressed as $\frac{p}{n+q} \times 100$ in percentage.

1. The rate of occurrence of malignant neoplasms.

Of 4,000 cancer cases in total, excluding cases without mention of names of diseases clinically diagnosed, which were confirmed at autopsy in the present

Table 55. Clinical Diagnosis (C. D.) of Cancer in View of the Pathological Anatomical Diagnosis (P. A. D.) in Different Organs.

Cancer by organ	C. D.		P. A. D.					Reliab. of C. D. in % p / (n±q)	s / 1
	Cases in co-incidence with P. A. D. Numb. (p)	Coincid. rate in %	Cases not in coincid. with P. A. D.	In total (n)	Cases in coinc. with C. D. (p)	Cases detected at autopsy Num. (q)	Detec. rate in %	In total (s)	
Cancer of the breast	82	98.8±1.1	1	83	82	0	0	82	0.99
Cancer of the uterus	209	95.5±2.4	10	219	209	29	0.2±0.04	238	1.08
Cancer of the lung	175	91.6±2.8	16	191	175	166	1.1±0.09	341	1.78
Liver cell cancer	129	42.9±2.9	172	301	129	60	0.4±0.05	189	0.63
Biliary cancer	23	59.0±7.9	16	39	23	139	0.9±0.08	162	4.15
Cancer of the stomach	685	92.8±0.95	53	738	685	278	1.9±0.12	963	1.30
Total malignant neoplasms.	3,569			3,569	3,569	431	3.84±0.19	4,000	1.12

statistics, cases clinically diagnosed as other than cancer amounted to 431 (10.7%). Inversely, the number of cases clinically diagnosed as cancer but not justified at autopsy is considered to be relatively small in Japan. Consequently, if corrected by the rate $4,000-431:4,000=1:1.12$, the annual number of 64,400 of deaths from malignant neoplasms (according to the statistics of mortality by the Ministry of Public Health, 1950) may be 72,128. If the relatively low reliability of the diagnosis in general hospitals other than university hospitals be taken into account, the number would be much greater.

Cases of malignant neoplasms are considered to be less frequent in Japan than in Europe and the United States. However, if the fact is taken into account that, in Japan, the number of persons in the cancer ages above 40 are estimated to be about two-thirds of those in the foregoing countries, the rate of occurrence would be almost equal in all of these countries. Consequently, the existence of a racial difference between Europeans and Japanese in the rate of occurrence of malignant neoplasms, as a whole, might not be admitted. Likewise, differences in manner of living in general, between Europeans and Japanese are considered to have little influence on the occurrence of the diseases.

The recent increase in number of cancer cases in Japan would be ascribed to the recent increase in reliability of the techniques for diagnosis of malignant neoplasms and to the relative increase in number of persons in the advanced age groups.

2. Clinical diagnosis of cancer in view of the pathological anatomical diagnosis.

In table 55 is presented data on the reliability (coincidence rate) of the clinical diagnosis of cancer in the five different organs designated by the International Society of Geographical Pathology, statistically estimated, as mentioned above, from the pathological findings at autopsy. In this table, cases clinically diagnosed as cancer but not justified at autopsy are excluded, for these cases are considered to be extremely rare in Japan.

As shown in the table, the reliability of the diagnosis varies considerably according to organs (12.9-98.8%). Likewise, the coincidence rate of the clinical diagnosis to the pathological findings at autopsy varies considerably in the same manner (0.63-4.15). This indicates that there is a considerable discrepancy between the clinical diagnosis and the pathological findings at autopsy.

Since the data in the table were obtained from a limited number of autopsy cases, they may not be generally applicable as they stand. As the reliability of the diagnosis is probably lower in hospitals other than the university hospitals, the actual number of cancer cases would be in general much greater than the number of cases exactly diagnosed as such in the whole clinics.

As for cancer of the breast as well as cancer of the uterus, the number of cases

clinically diagnosed as such coincide well with the number of cases confirmed at autopsy. Therefore, the number of the death cases from the diseases registered in the statistics of mortality by diseases is considered to represent well the real number of cases of the diseases. Consequently, it can be said that uterus cancer is more frequent in Japan than in the Western countries and vice versa for cancer of the breast. Fortunately, radical curability from the two kinds of cancer is tending to increase also in Japan, thanks to the advances in techniques of surgical operation.

Cancer of the stomach is more frequent in Japan than in the Western countries. Moreover, in view of the relatively low reliability of the diagnosis of stomach cancer, the number of stomach cancer cases is considered to be much greater in reality than it apparently is.

Cancer of the lung is considered to occur less frequently in Japan according to the statistics of mortality. However, in consideration of the low reliability of the diagnosis of the disease, the real number of cases is estimated to be much greater than it apparently is, though not so great as in the Western countries.

Cancer of the liver is definitely more frequent in Japan than in the Western countries. However, since not a few metastasis cases into the liver of stomach cancer are diagnosed as liver cancer, the real number of liver cancer cases is considered to be less than the number obtained from post-mortem certificates. On the contrary, biliary cancer is considered to be much more frequent in reality, for this disease is considerably difficult to diagnose exactly.

The number of cancer cases of the above 5 different organs varies according to districts and human races. No reason for this variation could be deduced from the present autopsy materials.

The statistics of cancer made on the basis of autopsy materials can not be immediately applied to evaluate the general geographical pathological features of the disease, since the data obtained only from the autopsy materials are considered to show more or less deviations from the reality. The real incidence of the disease may only be obtained, when, additional to the preceding statistics, the statistics of mortality by diseases and the statistics in hospitals are taken into consideration at the same time.

The present statistics have been established from the materials offered by the pathological departments of the medical colleges and universities throughout Japan, in cooperation with 25 members of the Pathological Department, Medical School, Hokkaido University.

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日本における癌の地理病理学（病理解剖および 試験切除による報告）

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国際地理病理学会が「癌の地理病理学」を宿題として選び 1954 年 9 月 Washington 市において第五回総会を開催するに当って、その日本国内委員会は筆者を日本における宿題担当者に選定した。

筆者は日本全国大学の病理学教室各位の援助を得て過去 5 年間の全病理解剖例 15,006 例中より悪性腫瘍屍剖検例計 4,182 例の詳細記載カードの贈与を受けた。さらに全国 9 大学に依頼して過去 3 年間の病的検査材料 29,768 例中よりすべての悪性腫瘍 6,930 例の記載カードを得た。

以上の計 11,112 例のカードを基として筆者は腫瘍の日本における統計学的調査研究を行い、とくに国際地理病理学会の要請によって乳癌、子宮癌、肺癌、肝癌、胃癌についてやや詳しくその統計的数値をあげた報告書を作製した。

報告は世界各国に送付されて各地区の報告者の成績と比較対照され、また国際地理病理学会の席上各地区の報告者および筆者によって報告された。

本論文がその一般報告書である。

報告書は国際地理病理学会要請の網目の充足に急で他の一般癌に迄広くおよばないくらいがあるが、各方面の要請に答えてその全文を公表させていただくことにしたのである。

本報告書作製に当って筆者に担当を命ぜられた地理病理学会国内委員会に敬意を表し、報告書の作製費用や種々の助言を与えられた厚生省癌疫学班に感謝し、多大な努力によって各教室の貴重な病理解剖、試験切除材料から詳細な記載カードを作製送附された全国各大学病理学教室各位およびカードの整理統計に助力された多数の北大病理学教室員の諸氏に深甚な感謝の意を表するものである。

なお本論文の発表に当ってよせられた日本生命保険協会および雑誌「癌」の好意に対しても併せて謝意を表する次第である（自抄）。



